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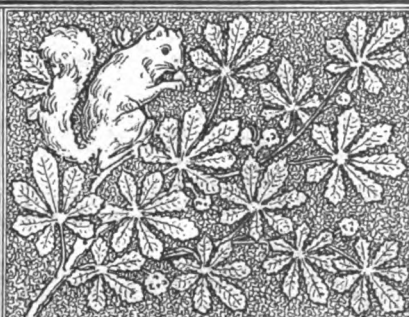
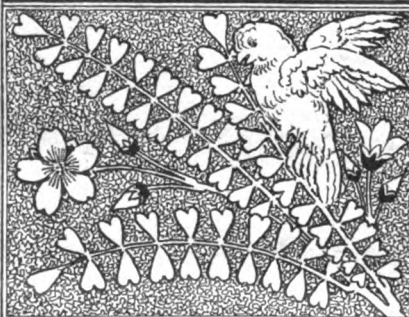


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JULY - SEPTEMBER



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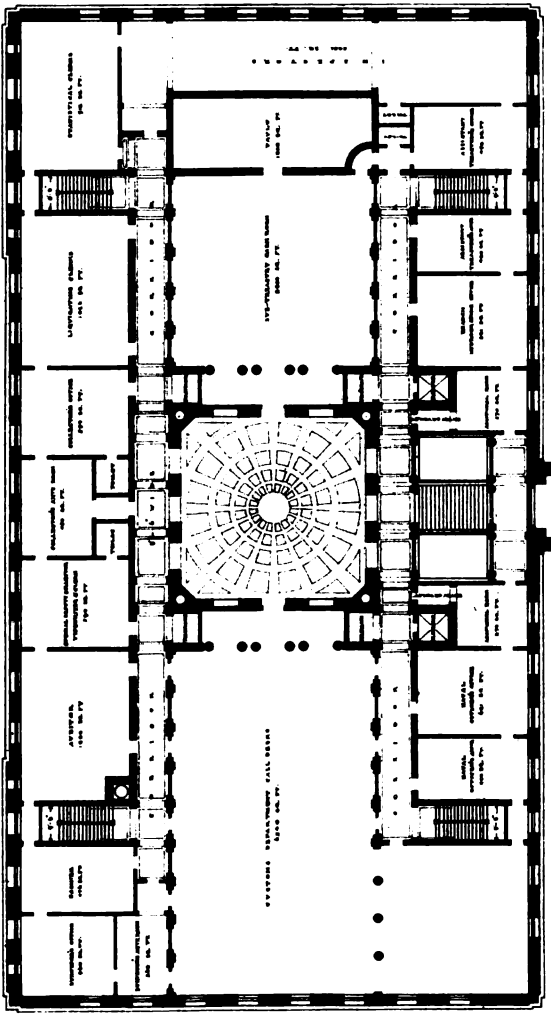
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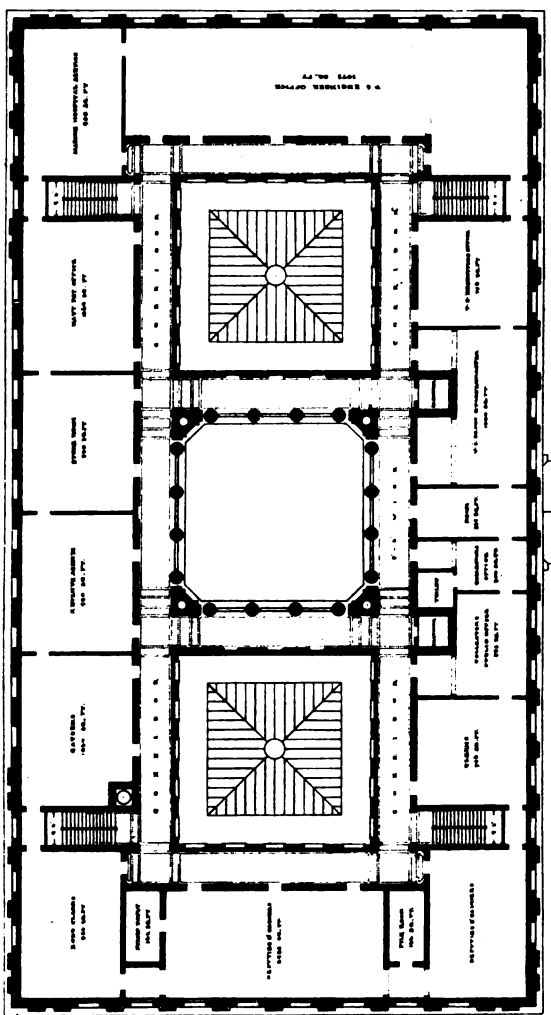
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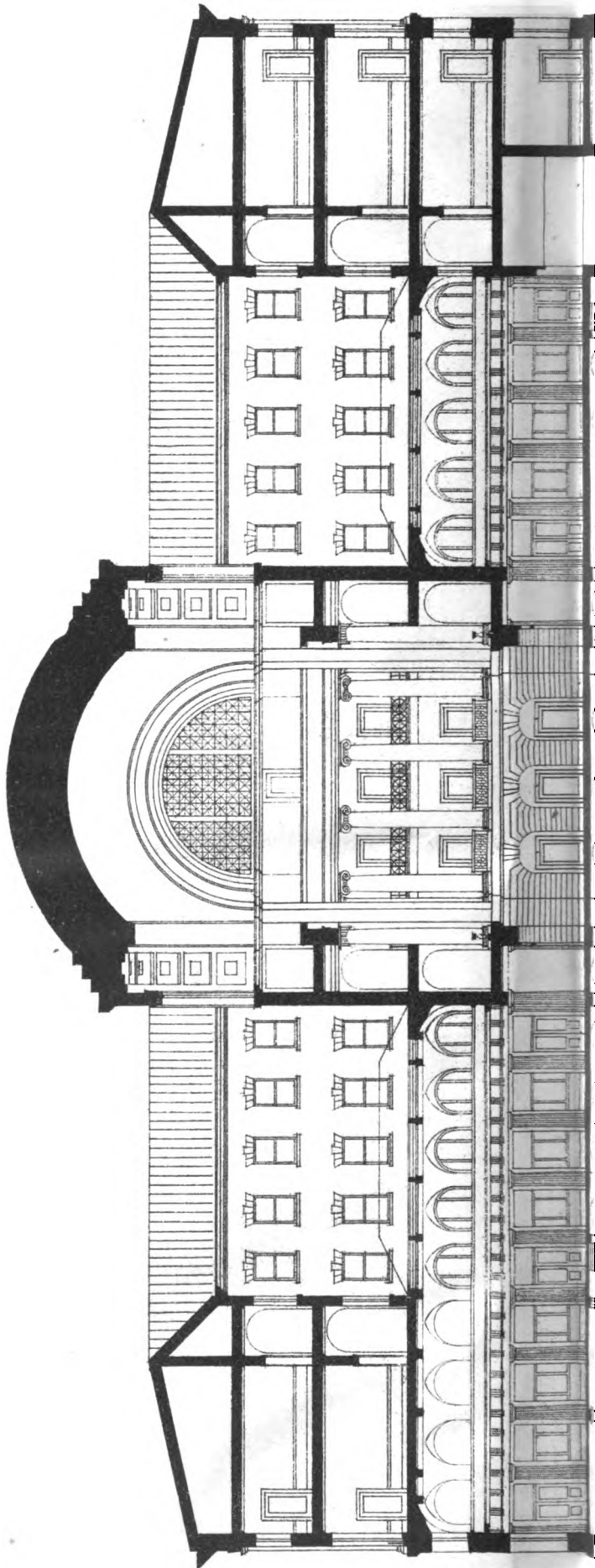
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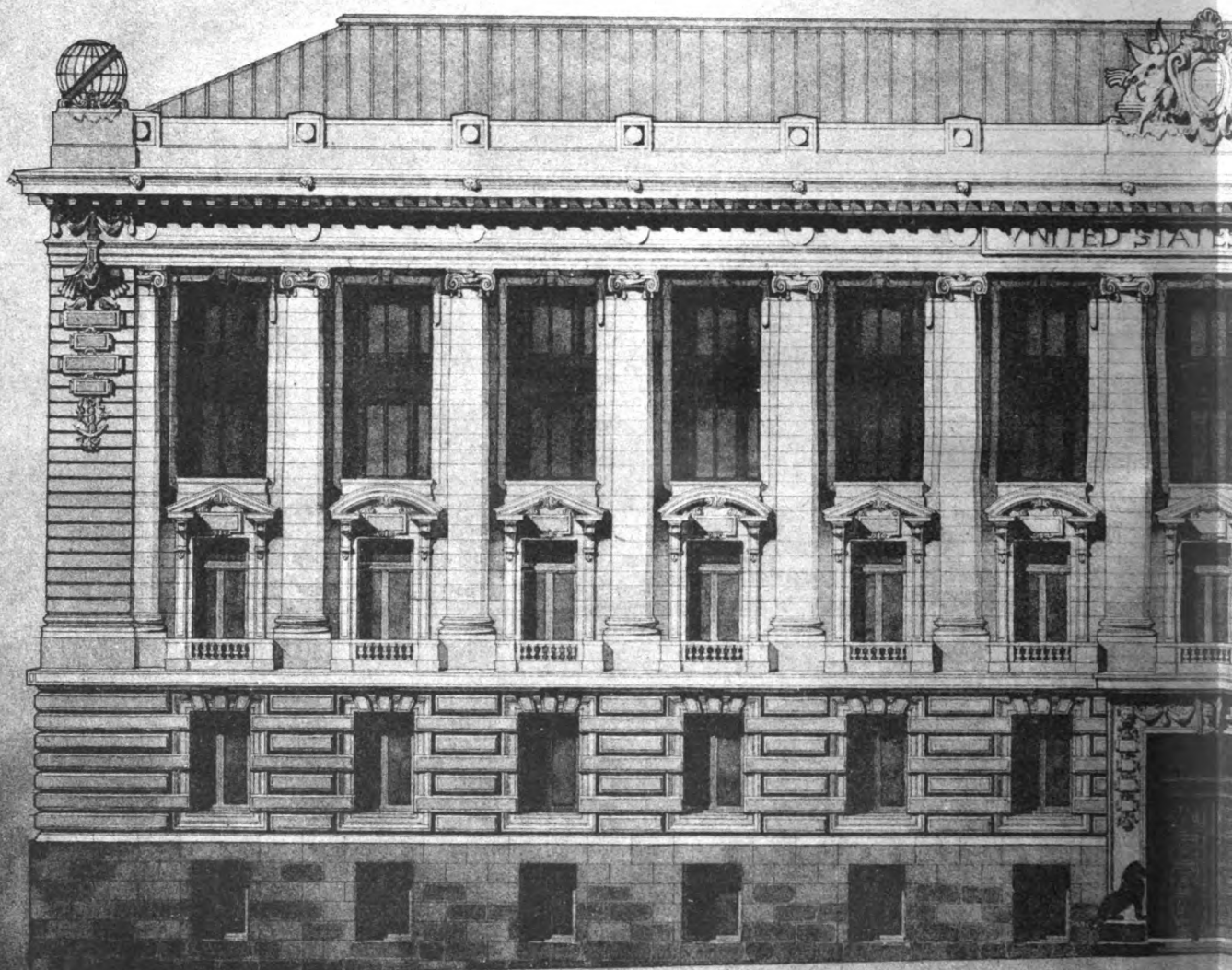
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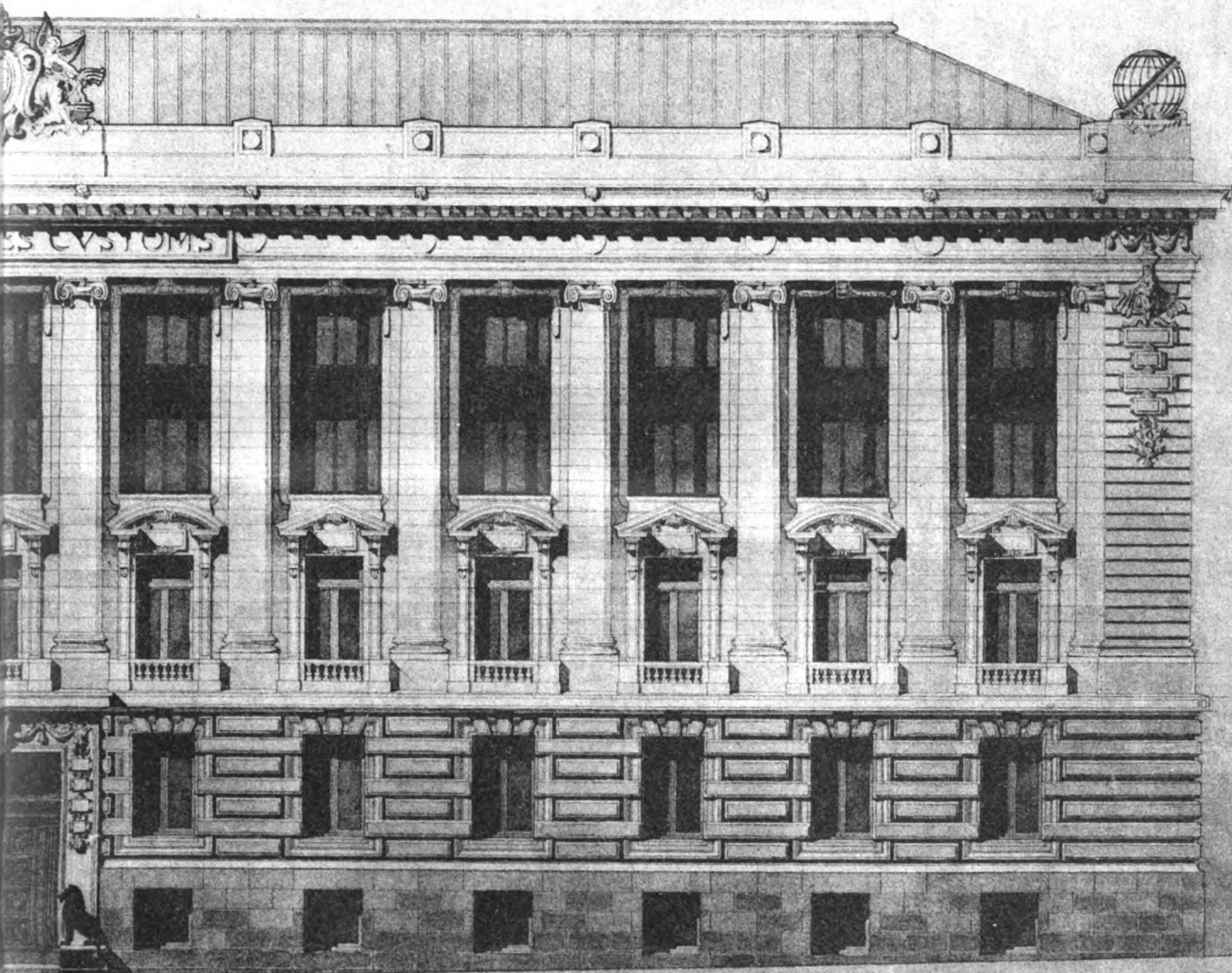
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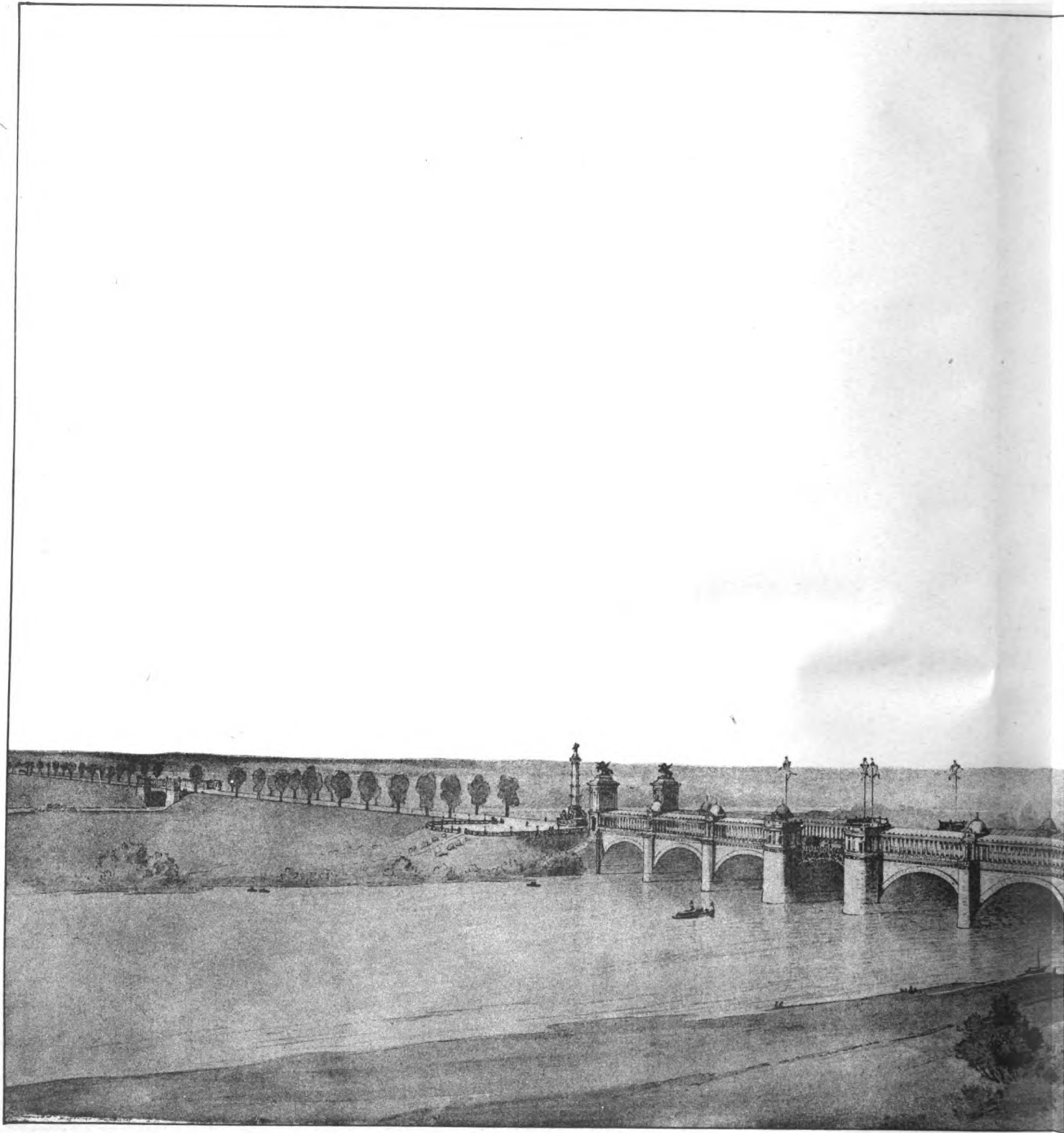


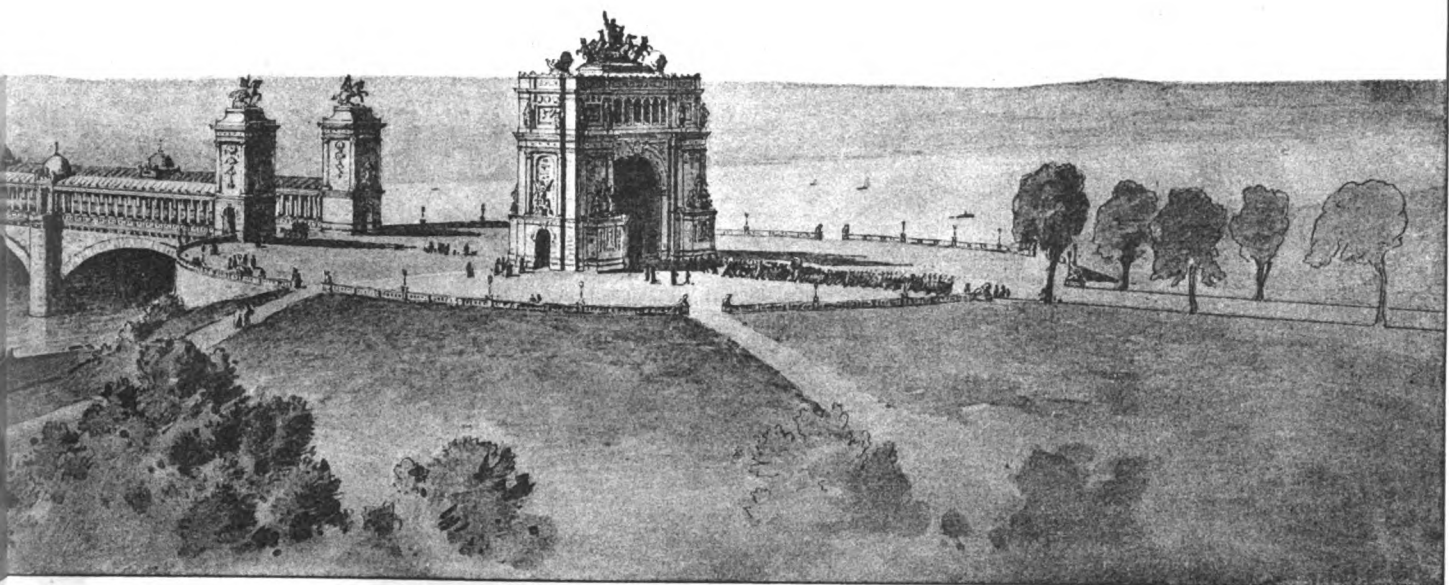
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SILENCE
MEDALLION
BY
PREAULT

FOR THE
JEWISH
CEMETERY
PERE LA
CHAISE

PARIS



FROM L'ART

Entered at the Post-Office at Boston as second-class matter.

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SUMMARY:—

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ONE of the attractions of the International Congress of Architects, to be held at the end of next month in Paris, is an exhibition of original drawings by architects, comprising particularly perspective drawings, elevations and drawings of interior decoration. All architects are invited to participate, and the exhibition, although it has been impossible to arrange to give as long previous notice as would have been desirable, will undoubtedly be of great interest. The drawings are to be shown in the rooms of the School of Fine-Arts, which will, of themselves, be an attraction to visitors; and the exhibition is to remain open during the session of the Congress, from July 30 to August 4. Announcement is made, also, for the benefit of intending visitors, that members of the Congress will be given free entrance to the Exposition grounds during the sessions of the Congress, by means of a card, which is to be obtained of the Committee of Organization of the Congress; and attention is called to the advantages which may be secured by the purchase of one or more of the "Bons de l'Exposition." These "Bons," in addition to twenty coupon tickets of admission to the Exposition, carry with them the right to a reduction of one-fourth in the price of admission to the various "spectacles" connected with the Exposition; or, if the bearer prefers, to a reduction in the price of excursion tickets on any of the great French railways, or the steamer lines to Algiers, Tunis or Corsica, of about one-third, reckoned on twice the price of a single ticket. As the "Bons," with the coupons removed, can now be bought in Paris for six francs, or less, they may be the means of making an important saving in the cost of a visit to the Exposition; and, in addition to this advantage, they give a right to participate in a lottery, the drawings of which occur at stated intervals.

A LARGE number of the most distinguished architects in Germany have issued an address, calling upon the profession, as a "duty of honor," to follow the example of the German Government and German manufacturers in participating earnestly in the Paris Exposition by attending the International Congress of Architects. The address gives the principal particulars of the Congress, and mentions that the Society of Architects and Engineers of Westphalia and Lower Rhine has appointed a committee which will, on application from any German architect, arrange for rooms in Paris for the time of the Congress, give information in regard to the journey, the stay in Paris, the interesting sights of the city and the Exposition, and provide, so far as possible, for the comfort of their professional brethren and their families.

IT is curious that the epoch of "universal prosperity" which, as the politicians tell us, we are now enjoying, should be characterized by the largest proportion of failures in business ever recorded, and is now to be made still more ecstatic by general reductions in the wages of mechanics employed in building. In several places, reductions of ten per cent have been fixed for July 1, and, although the parties interested have little to say about the matter, similar action will probably be taken throughout the great cities. As building in the cities is almost at a standstill, on account of the enormous advances made last winter in the prices of materials, it is not surprising that the contractors, unable to keep their men employed, but reluctant to turn them away altogether, should have adopted a compromise of this sort; but it is hard on the workmen and their families, who, with incomes materially less than they have been of late years, must pay advanced prices for their flour, oil, ice, sugar and all other supplies controlled, directly or indirectly, by the great Trusts. In all probability the men will accept the change with resignation, for they can easily see that their employers are losing money, and that unless a reduction in wages is made, great numbers of them must be discharged altogether; while a strike would simply relieve the contractors of a heavy burden of wages paid to men who are earning little or nothing, and are kept along out of consideration for them and their families. Meanwhile, it would be worth someone's while to study the present "prosperity" of this country, in the interest of workmen, and compare it with the condition of countries in which speculators are less "prosperous," but where prices of commodities are not regulated by protected monopolies, and where the modest, but important, industry of building is not interfered with by the sudden doubling or trebling of prices of materials by syndicates, before whom the public is helpless. The New York newspapers say that more than one hundred million dollars of American money have been sent to Europe within a few weeks, for investment where "prosperity" depending upon extortion does not threaten revulsion and disaster; and it is also reported that about five hundred thousand people, who have seen factories closed and dealers ruined around them by the Trusts at the same time that prices have been doubled, have emigrated within a short time from this country to Canada or Europe. It is not likely that all these people are mistaken in regard to the comparative advantages of living, or of investing property, in this country and in Europe; and it would be desirable to have the information on which they act collected and made public, not for the sake of inducing other Americans to follow their example, but in order that conditions here may be corrected, if necessary, so as to make it pleasanter for those who are left here to remain.

THE Westminster Chambers case in Boston has brought up some curious legal questions. Although there is a prevalent notion that a special restriction was imposed upon the height of the buildings around Copley Square, partly in deference to the feelings of the officials of the Public Library and Trinity Church, who thought that the effect of their buildings would be injured by a lofty structure in their vicinity, the Legislature was far too sensible to consider any measure for curtailing a person's property-rights on such grounds. Even when it was shown that the Art Museum's collections, in which the public has a deep interest, would be endangered by a ten-story building so near, relief had to be sought, not by direct action, which, although justifiable, would be of doubtful legality, but indirectly, through the application of the Park Act, which confers a special control over building in the neighborhood of a public park, for the benefit of the citizens who use the park. Copley Square was, accordingly, declared a public park, and the property around and near it placed under the same control as that conferred in the case of other parks constituted under the Park Act. In the neighborhood of some of the Boston parks the height of buildings is restricted, and, following this precedent, the Legislature imposed a corresponding restriction on the buildings around Copley Square, for the benefit, not of the Museum of Fine Arts, or of Trinity Church, or of the Public Library, but of the public which is to use Copley Square as a park, and is to derive benefit to its health from the light and air which will reach the park over the adjoining buildings.

THIS solution of the difficulty seems simple, but there are several elements in it which the courts will probably have to pass upon. In the first place, the device of making a park, under the Park Act, out of what was already an open square, simply for the sake of applying to it restrictions not intended for it, although previously adopted in the case of Commonwealth Avenue, and for a similar purpose, is open to objections of various kinds. In the case of the Back Bay Fens, limitation of the height of buildings is secured by means of a contract, which grants right of access over the parkways to those buildings whose owners have conformed to certain specified restrictions; but this is a very different affair from seizing a square which has been laid out and built upon for a quarter of a century, making it into a park, and imposing upon the abutting owners conditions which are made the subject of a contract in the newer parks. It is true that in Copley Square any damage caused by the change must be paid by the city of Boston; but this brings up another question, whether the Legislature has the right, under the Park Act or any other, to lay out parks in cities, at its own pleasure, and under such conditions as it sees fit, without the request or consent of the authorities or people of such cities, and to compel the taxpayers of the city to pay the cost. It is obvious that such a right, if it is conferred by Massachusetts law upon the Legislature, is liable to great abuse, and the people of Boston, before they have paid the thousands which its application to Copley Square will cost them, are likely to take precautions against its extension.

AN accident took place a few days ago in Philadelphia, very similar to that which recently occurred at the Paris Exposition. In the new extension of the building of the Bell Telephone Company, a roof was being put in, of concrete, on a skeleton of expanded metal. As nearly as we can make out from the newspaper accounts, the concrete roofing, which was supported by iron girders, had so far hardened that the wooden centring had been loosened or taken out altogether just before the accident. It seems, however, that the upper surface had not received its final profiles, and men were set at work to put on more concrete, sloping it so as to direct rain-water to given points. With incredible carelessness, the men doing this work used, as we are told, "heavy iron rammers" to consolidate the new material over the freshly made, and consequently weak, slabs of the roof. It can easily be imagined that the effect of this treatment on the slabs of fresh concrete was to break one of them, which fell to the floor below, which was of similar construction, breaking out a portion of it, and the whole mass then fell to the first floor, carrying with it two men, both of whom were killed.

OUR readers will remember the Carnegie Library, at Pittsburgh, Pa., which is not long completed, and will be interested to learn that it is proposed to move the structure bodily to another location, about a thousand feet distant. The building stands at the entrance to Schenley Park, and the improvements now being made around it will, it is feared, injure its appearance, so that its removal is desirable. The weight to be moved is calculated at about fifty-eight thousand tons. The construction is of steel, cased with stone, and the question whether the thin stone casing will hold properly to the metal skeleton during the trip is a very important one; and the problem is further complicated by the fact that a ravine, a hundred feet deep and two hundred feet wide, intervenes between the present site and the one proposed, and must be bridged or filled in some way before a building a hundred and fifty feet wide and four hundred feet long can be safely transported across it.

THE Pratt Institute, of Brooklyn, has established a course of instruction in artistic metal-work, to be given in sixty days of tuition, accompanied with practice. The fees are fifteen dollars for the day course, and five dollars for the evening course. Sixty days of instruction and practice seems a rather short time for qualifying persons "to enter the profession as artist-artisans, equipped not only with artistic appreciation and power of execution, but also with a knowledge of the requirements of the trade, thus dispensing with the usual apprenticeship necessary to the adjustment of principles to practice," but no doubt the course will be well managed. Persons interested may obtain further information from Mr. Walter S. Perry, Director of the Department of Fine Arts, Pratt Institute, Brooklyn.

AN interesting meeting of the American Forestry Association was held last week in New York, and much encouragement may be derived from the reports presented. One of the most important observations made was on the progress of tree-planting in the Southwest, which has gone on steadily, though quietly, until it has produced a sensible change in the appearance, as well as in economic conditions, in that part of the country. In Kansas, where thirty years ago not a tree was to be seen, groves, often of considerable extent, are now common, and the prairies are diversified with rows of trees, planted to shelter the crops. The railroad companies, long ago, set the example of utilizing their land for forestry, and they, as well as those who were early in imitating them, are now reaping the benefit of their forethought. It will make those who knew Kansas in its palmy days smile to think of the State as a forest region, but one of the members of the Association predicted that it would soon become so, and it is possible that the exhausted wheatfields of this and the neighboring States may yet prove profitable to their owners as a source of timber, while, indirectly, they increase the value of the agricultural lands in their neighborhood by equalizing and increasing the rainfall.

MEANWHILE, forest cultivation in other States, where owners are sufficiently convinced of its importance, is kept in check by taxation. The local assessors, who, like assessors everywhere else, conceive their duty to be to lay hands principally on the property of those without defence or political influence, find that the largest tracts of land capable of being devoted to timber-growing belong to non-residents, and assess these in such a way as to bring upon them the greater part of the local taxation. The owners, far from being encouraged to plant trees, which will take half a century to grow, are compelled to cut everything already on the ground, in order to pay the taxes, and then abandon the territory altogether. Thus it comes about that the Northwestern States own millions of acres of land, once covered with forests, but now bare and deserted, a monument to foolish taxation, which has robbed the community indulging in it of a thousand times as much as it ever congratulated itself on extorting unfairly from outsiders. Next to this policy of killing the goose which lays the golden egg of taxes, and, in a great degree, in consequence of it, the Northwestern States, so far as their forests are concerned, suffer most from fire. If the woods were systematically cared for, forest conflagrations would be as rare in Wisconsin and Michigan as they are in Germany; but the policy of making it for the interest of owners to strip their land as soon as possible of everything valuable, and then abandon it, leaves it a neglected waste, covered with inflammable rubbish and ready for the first spark to set it in a blaze, which does not stop at the boundary of the abandoned land. The result is that, in some States, nine-tenths of the timber is destroyed by fire, leaving only one-tenth for use or sale. As a rule, the owners of timber land are now awake to the value of proper forest regulation, and understand the means of preventing forest fires, but they cannot struggle against official discouragements.

AN idea which may be commended to newspaper reporters, school-children and others is that adopted for Germany by the General German Language Society, which seeks to purify current German writing and speaking from the foreign words which, for various reasons, have come into use, until they form a large part of the language. The purpose of the Society, as expounded in its circular, is to excite love and comprehension for pure German, and to try to clear it from unnecessary foreign growths by advocating the avoidance of foreign words for anything that can be well expressed by German ones, and by promoting clearness and elegance in ordinary speech. The Emperor, as is well known, earnestly favors the movement, and for many years the "menus" on the Imperial table have been purely German, while, more recently, a general order has been promulgated in the army, requiring the abandonment of certain foreign expressions, for the purpose, as the order says, of promoting purity of language among the soldiers. The Society has now nearly sixteen thousand members, and if all of them write and speak such beautifully clear, idiomatic German as the author of the circular, they must be doing a precious work.

A DAY IN PROVENCE.—II.



Church Spire, Lambesc.

AT Lambesc we left the national highway behind us, and started on a delightful run down a narrow, winding road, with good macadam surface, following the green valley of a little branch of the Touloubre — a grateful contrast to the white road-bed and dry hills we had just passed over. The continuous down-grade, combined with our fears of a late arrival for *déjeuner*, encouraged such a lively pace that we rushed into Pelissanne before we could believe the necessary distance had been covered. Here a belfry with iron top and a curious group of church

buildings detained us only a short time, for the pangs of hunger prevented a just appreciation of what seemed to be quite ordinary mediæval work. Pushing on around the church, which stands directly in the way of the present main road, we hurried on to Salon, where, after enquiring the way of a local bicyclist, we arrived at the Grand Hôtel, late, but welcome to all the house afforded. Iced siphon, good local wine, and a generous dinner soon repaid us for our forced pedalling, but, sad to say, took away all ambition for the long afternoon trip originally planned. Tired muscles, once relaxed, recover slowly; and our hot morning ride seemed discipline enough for that time. Yet our original plan was to reach Arles before night, that we might be ready for the entertainment promised for the Fourteenth, the French Fourth of July.

An afternoon train was naturally the first suggestion. The map

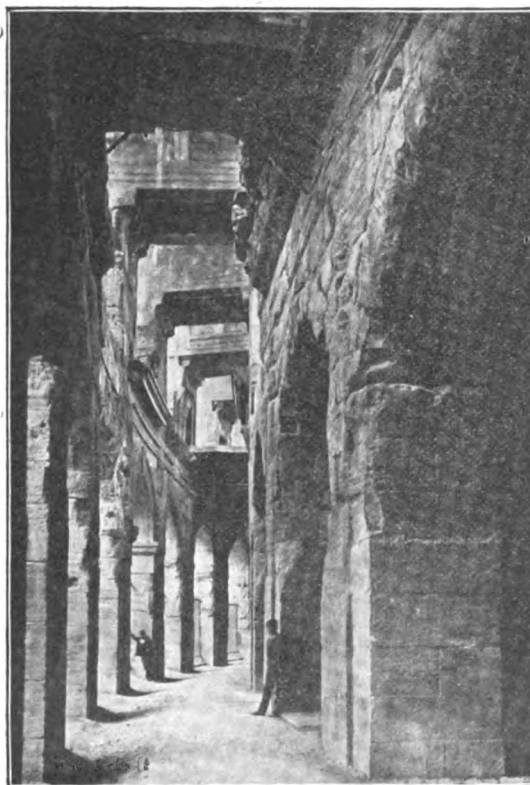


Place du Forum, Arles.

showed a railroad through Eyguieres, Paradou and Fontvieille, towns that we had hoped to visit, on the northern edge of the great plain; but consultation with our landlord brought out the sad fact that the

¹ Continued from No. 1279, page 101.

afternoon train over this *chemin de fer régional* left Salon at about six, and arrived at Arles about nine in the evening, taking three hours to drag its coaches and stone-laden cars over the twenty-eight intervening miles. The only alternative at first seemed to be the straight national road; but, as we had had enough of national routes for that



Corridor of the Arena, Arles.

day, it was decided to see Salon in an hour's walk and ride, and then meet the through express at Miramas, some six miles away to the south. Starting at once to see the twelfth-century doorway at Saint Michel, we found the Romanesque portal less interesting than the older door at Aix, and then pounded away over the rough stone pavements to visit the northern section and the collegiate church of Saint Laurent. With the exception of the lower stories of the old tower, Saint Laurent dates from the time of Jean de Cordonne, Archbishop of Arles, who in 1344 built the plain church that to-day is the only survivor of several monastic buildings. The place is now famous as the tomb of Michel Nostradamus, the Provençal astrologer, who resided at Salon for years, and gained a reputation for prophecy and learning that made him adviser to Catherine de' Medici and doctor to Charles IX.

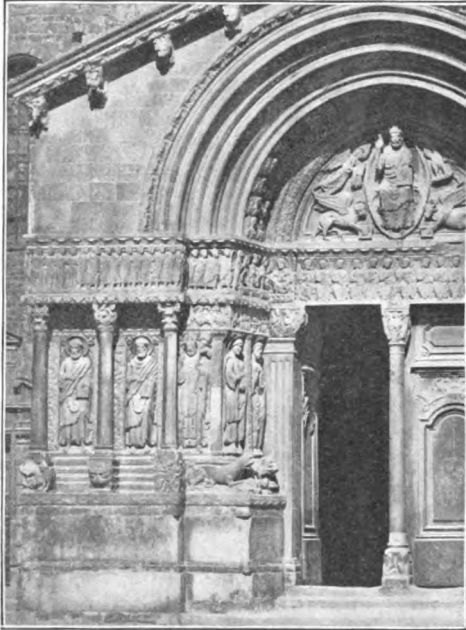
Since this church offered little of special architectural interest, except the fragment of the older building now under the picturesque south tower, we returned to the central part of the town, and, passing the fine old gateway and clock-tower, started along the road to Arles.



Place de la République, Arles.

Fortunately, our route to Miramas turned off to the south, after a few rods of very indifferent riding. The Salon and Arles sections of the Carte de la France show the distance between the cities to be about twenty-four miles, with eleven miles in an absolutely straight east and west line, that follows the north bank of the Langlade canal

across the level plains of the Crau. At the hotel we were assured that the distance could be easily covered in a little over an hour—a statement we did not attempt to verify; for we were quite content to leave the proof to men with less heavily loaded wheels. With plenty of time ahead, we jogged along a wide level road, passing several omnibuses filled with country people returning from Salon markets.



The Porch: St. Trophime, Arles.

On either side the luxuriant trees and low growths of the marshes were occasionally broken by quiet pools whose shallow depths, joined by numerous canals and ditches, seemed to form a veritable network of waterways.

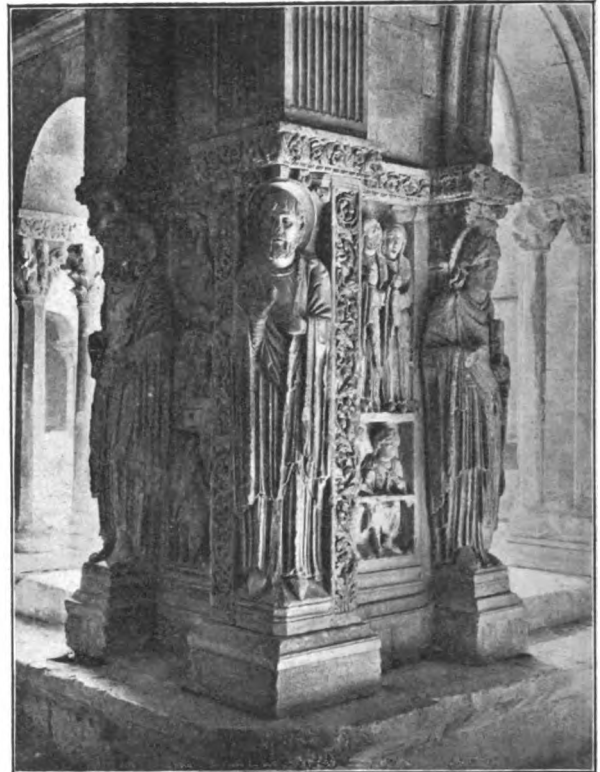
We expected to visit the ruined château at Miramas, some three kilometres beyond the station, and a little farther on to see the triumphal arch of the Flavian bridge at Saint Chamas; but, as a troublesome pedal caused delays and repairs along the way, we arrived at the

modern village of Miramas-Gare only in time to buy tickets to Arles, to pay our ten centimes for bicycles, put our wheels on board, and hurriedly find places in the crowded train. Many times during that ride we congratulated ourselves on the change in plan, even though we had omitted the towns on the southern slope of the Alpilles. Taking saddle again at the Arles station, we passed through the open avenues of the Jardin de la Cavalerie to the towers of the city gates, when we were at once in the narrow, tortuous streets of the mediæval city.

Arles is not known for its late buildings, though, by walking its roughly paved ways, many good sixteenth-century houses are to be found. To the student, and even the casual visitor, the Roman and Romanesque monuments are of far greater interest, for Arles has to-day some of the best examples of ancient building and sculpture to be found in Europe. Fortunately, several hours of daylight remained after our quarters were secured in the Place du Forum; and we hurried to catch a first glimpse of the famous buildings we were to study in detail later on. Leaving bags unpacked and wheels uncleaned, we tramped from the hotel, past the unknown fragment of Roman architecture at the head of the Place du Forum. However, as we were to pass that way many times, we did not stop to examine closely its broken pediment and columns, but continued through the Rue des Arènes to the great amphitheatre.

To-day, as in the days of Augustus and Constantine, this huge Roman ruin is the centre of Arlesian life and interest. Thanks to

the restorations made since 1846, the double-storied outer arches and lower interior seats are now in good condition. Yet the building



Pier in Cloister: St. Trophime, Arles.

no longer affords room for the 26,000 people who applauded the conquerors in the old gladiatorial days. The Arena is now used for less sanguinary entertainments; and the *courses de taureaux*, held almost every Sunday during the summer season, are attended with unabated interest. Large crowds, even, come to see the bloodless, free-for-all sports occasionally offered, when prizes are given to the citizens who succeed in tearing away the barbed rosettes from the shoulders of wild young heifers and bulls.

Not attempting to enter the great enclosure, which we expected to examine thoroughly after the bullfight of the morrow, we walked along the side of the huge elliptical wall, studied the peculiar construction of its stone arches, and tried to imagine the appearance of the whole, when arches, columns and mouldings were in their originally complete state. The building was partly destroyed by use as fortress and stronghold by Goths, Saracens and mediæval warriors. Previous to 1830, also, the interior was filled with houses of the poorest class. Yet the endless arcades, even in ruined form, seem to tell of far greater enterprises and ambitions than those of wild invaders or local chiefs, and by simple dignity alone recall the might and power of imperial Rome.

From the south of the Arena to the picturesque ruins of the Theatre is only a short distance. We were soon looking into the meagre ruins from the raised ground at the rear of the stage. Evidently,



A Corner of the Cloister: St. Trophime, Arles.

THE AMERICAN ARCHITECT AND BUILDING NEWS

ADVERTISERS' TRADE SUPPLEMENT.

No. 218.

SATURDAY, JULY 7, 1900.

VOLUME LXIX.
No. 1280

THE AMERICAN BRIDGE CO.

THE American Bridge Company have issued the following circular letter to the trade:—

As a result of numerous conferences it has been deemed expedient to organize the American Bridge Company, incorporated for the purpose of designing, building and erecting bridges and all classes of metallic structures. The facilities at our disposal are such that we have every confidence that we shall be able to give you the advantage of very favorable quotations and at the same time be enabled to avoid delays in delivery which in the past have proved so vexatious in many instances. We solicit your enquiries, which shall have our very best attention.

Accompanying this is a list of the various Bridge Companies forming the Consolidation, as follows:

American Bridge Works, Chicago, Ill.
Berlin Iron Bridge Co., East Berlin, Conn.
Buffalo Bridge & Iron Works, Buffalo, N. Y.
Carnegie Steel Co. (Keystone Plant), Pittsburgh, Pa.
Edge Moor Bridge Works, Wilmington, Del.
Elmira Bridge Co., Elmira, N. Y.
Gillette-Herzog Mfg. Co., Minneapolis, Minn.
Groton Bridge & Mfg. Co., Groton, N. Y.
Hilton Bridge Construction Co., Albany, N. Y.
Horseheads Bridge Co., Horseheads, N. Y.
Lafayette Bridge Co., Lafayette, Ind.
Lassig Bridge & Iron Works, Chicago, Ill.
N. J. Steel & Iron Co., Trenton, N. J.
New Columbus Bridge Co., Columbus, Ohio.
Pittsburgh Bridge Co., Pittsburgh, Pa.
A. & P. Roberts Co. (Pencoyd Iron Works), Pencoyd, Pa.
Post & McCord, Brooklyn, N. Y.
Rochester Bridge & Iron Works, Rochester, N. Y.
Schultz Bridge & Iron Works, Pittsburgh, Pa.
Schiffler Bridge & Iron Co., Pittsburgh, Pa.
Union Bridge Co., Athens, Pa.
Milwaukee Bridge Co., Milwaukee, Wis.
Wrought Iron Bridge Co., Canton, Ohio.
Youngstown Bridge Co., Youngstown, Ohio.

This list contains all the leading companies that manufacture bridge and structural work in this country, with the combined capacity of 600,000 tons per annum. The Pencoyd plant, of the A. & P. Roberts Company, also comprises one of the best and most complete rolling mills for structural material in existence, with a capacity of 200,000 tons per annum. This puts the American Bridge Company in a position to furnish all classes of bridge and structural work at an absolute minimum of cost, and in the very shortest possible time, and this has already been an

nounced as the future policy of the Company. No advance in prices will be made, but the cost of production will be reduced to an absolute minimum, and judging from the known facilities of the various plants, the facts would seem to justify the statement.

The Directors of the company are as follows:

Percival Roberts, Jr., A. & P. Roberts Co. (Pencoyd Iron Works), Pencoyd, Pa.
Alfred C. Case, Carnegie Steel Co., Pittsburgh, Pa.
William H. McCord, Post & McCord, Brooklyn, N. Y.
Charles M. Jarvis, Berlin Iron Bridge Co., East Berlin, Conn.
William H. Connell, Edge Moor Bridge Works, Wilmington, Del.
Walter Hawxhurst, Elmira Bridge Co., Elmira, N. Y.
Charles Macdonald, Union Bridge Co., Athens, Pa.
Frank Conger, Groton Bridge Co., Groton, N. Y.
James P. Kennedy, Youngstown Bridge Co., Youngstown, Ohio.
Lewis S. Gillette, Gillette-Herzog Mfg. Co., Minneapolis, Minn.
John F. Alden, Rochester Bridge & Iron Works, Rochester, N. Y.
Walter G. Oakman, Guarantee Trust Co., New York, N. Y.
J. P. Ord, General Electric Company, Schenectady, N. Y.
Robert Winsor, Kidder, Peabody & Co., Boston, Mass.
Robert Bacon, J. P. Morgan & Co., New York, N. Y.
Charles Steele, J. P. Morgan & Co., New York, N. Y.
Paul E. DeFere, 40 Wall St., New York, N. Y.
Robert S. Green, 1 Montgomery St., Jersey City, N. J.
J. W. Walker, Schiffler Bridge Co., Pittsburgh, Pa.
Abram S. Hewitt, Cooper, Hewitt & Co., New York, N. Y.
August Belmont, August Belmont & Co., New York, N. Y.

The majority of this Board are practical bridge men who have in years past made a success of their individual companies. The financial end is unusually strong, being represented by firms and institutions of world-wide financial strength; thus forming a combination of practical and successful bridge men, backed by the strongest of financial resources.

The executive organization is made up entirely of men of large practical experience, headed by Percival Roberts, Jr., one of the leading rolling-mill managers of the country. The Pencoyd plant of the A. & P. Roberts Company, comprising a rolling-mill with a capacity of 200,000 tons per annum, and the most complete bridge and structural plant in

the world, has all been developed under his personal supervision, and is the result of his energy and ability, eminently fitting him to head an enterprise of this kind.

Joshua A. Hatfield has been appointed as assistant to the President, and will also have charge of the sales of the rolling-mill products of the Pencoyd plant—a position which his long and favorable connection with the sales department of the rolling-mill interests of the country makes him especially adapted to.

The engineering department is in charge of Mr. Charles C. Schneider, formerly Chief Engineer of the Pencoyd Iron Works, of the A. & P. Roberts Company, with the title of Vice-President, in charge of engineering. Mr. Schneider has full charge of all questions of engineering, including the preparation of all plans, estimates and working-drawings—all engineers of the company, whether engaged in the contracting, operating or erecting departments, are under the Vice-President in charge of engineering. At different localities throughout the country are stationed a corps of designing engineers to prepare preliminary plans and estimates, and at each plant will be located a full and complete corps of engineers and draughtsmen to prepare plans for the work fabricated at that particular plant.

The operating department is in charge of Mr. Charles M. Jarvis, formerly President of the Berlin Iron Bridge Company, with the title of Vice-President in charge of operating. As soon as contracts for any work are taken they are immediately turned over to this department for execution, and consequently all the plants and erecting forces of the company belong in this department. At each plant is a manager, with full charge over all employes and the operations of that particular plant. Where a number of plants are closely located, they are placed under one local manager, each plant being equipped with a superintendent. All managers are under the direct charge of a General Manager, Mr. James P. Kennedy, formerly President of the Youngstown Bridge Company, who moves about among the various plants in order to see that all are working in one harmonious whole, and that each has the advantage of the experience of every other plant. The erecting is also in charge of the operating department, and this is under Mr. William Wenas, as Superintendent. Mr. Wenas has had full charge of all the Pencoyd erecting for a number of years, and gained a world-wide reputation but a short time ago for the economical and expeditious manner in which he handled the erection of the famous Athara Bridge.

All the sales of the Company are in charge

of the contracting department. This is divided into three distinct parts: railway contracting, highway contracting and structural contracting.

The railway contracting is in charge of Mr. Charles Macdonald, formerly President of the Union Bridge Company. The highway contracting is in charge of Mr. Frank Conger, formerly President of the Groton Bridge & Manufacturing Company, and the structural contracting is in charge of Mr. W. H. McCord, formerly of the Post & McCord Company. The preparation of all proposals and contracts is in charge of this department. The company have opened contracting offices in different parts of the country, each office reporting daily, by wire, to various members of the contracting department. The contracting department of the American Bridge Company is one of the most important, as here are made up the proposals and estimates on all work, and it might almost be said that on the careful judgment and management of the members of this department depends chiefly the success of the company.

The mechanical department has been made of equal importance with all other departments, and has been placed in charge of Mr. James Christie, formerly Mechanical Engineer of the Pencoyd Plant, with the title of Vice-President. The mechanical details of all the various plants belong to this department, and the selection of Mr. Christie as the head ensures the American Bridge Company of mechanical equipment that will guarantee the production of a pound of finished bridge material at the absolute of minimum expenditure power.

The financial department is in charge of Mr. William H. Connell, formerly President of the Edge Moor Bridge Works, as Treasurer, with F. M. Wyant, formerly General Manager of the Wrought-iron Bridge Company, and F. A. Schmidt, formerly Secretary and Treasurer of the Youngstown Bridge Company, as Assistant Treasurers.

The auditor of the American Bridge Company is Mr. Charles C. Price, formerly with the Pencoyd Iron Works, of the A. & P. Roberts Company.

The purchasing department is in charge of Mr. Francis W. Heisler, formerly Purchasing Agent for the Edge Moor Bridge Works, with headquarters at No. 259 South Fourth Street, Philadelphia, Pa. The assistant purchasing agent is Mr. E. A. Muench, formerly Purchasing Agent for the A. & P. Roberts Company.

The Secretary of the company is Mr. Douglas O. Morgan, formerly a member of law firm of Seward, Guthrie & Steele.

AMERICAN BRIDGE CO.,
100 BROADWAY, NEW YORK, N. Y.

KINNEAR'S STEEL ROLLING DOORS, SHUTTERS AND PARTITIONS.

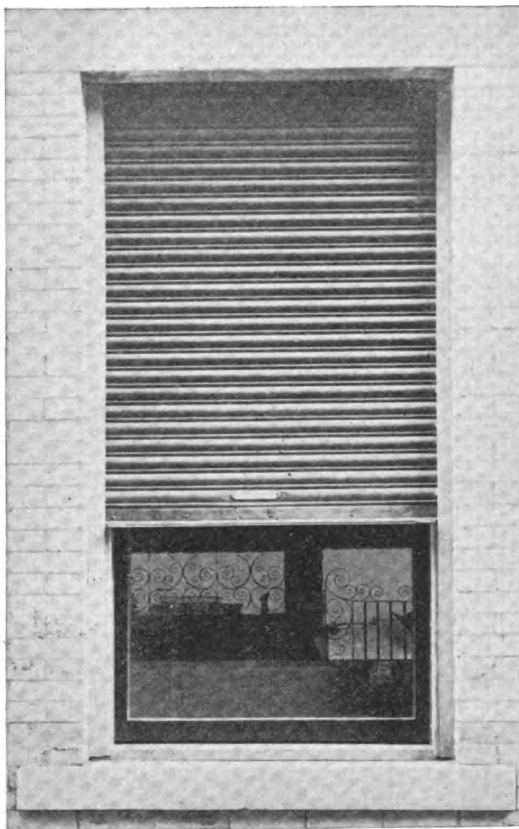
For a number of years it has been a serious problem to architects and owners of buildings to thoroughly protect buildings from fire, especially where the buildings embody architectural beauty.

The application of what may be termed the standard fire-shutters is to the majority of architects not a pleasant consideration, as they are not only extremely unsightly, but difficult to operate as well.

The great losses sustained by the insurance companies and greatly increased rates make it necessary, however, to have efficient and approved fire-protection on exterior exposures.

Within the past few years the Kinnear Mfg. Co., of Columbus, Ohio, have placed on the market a series of constructions embraced in their steel rolling doors, shutters and partitions, which not only make them peculiarly adaptable to all classes of buildings, but overcome as well the unfavorable features of swinging shutters. The accompanying cut of Kinnear's Steel Rolling Shutter shows a construction which is particularly suitable for business blocks, where an efficient and durable fireproof shutter is required and one which (when open) is invisible. In the cut displayed, the construction is such that the shutter when rolled up, or open, is pocketed in the box behind the lintel or window cap, and when closed does not detract from the appearance of the building; at the same time forming one of the best fire-protections known.

These shutters are so constructed that they can be operated from the interior of the building without raising the sash and are



Steel Rolling-shutter.

operated with perfect ease, even in the most severe wind storms.

In addition to this construction the Kinnear Mfg. Co. have a special automatic construction, applicable in the same manner, wherein the shutters are always open, but close instantly when subjected to 150 degrees (Fahrenheit) heat; this arrangement is so reliably fireproof that the cost of shutters is quickly saved in reduced insurance rates.

This Company also manufacture a large number of standard constructions for steel rolling doors and partitions, which it is claimed are vastly superior for purposes where such devices are used, and their illustrated catalogue "H" is fully descriptive of many of these standards.

The Company maintains offices and branches in all the principal cities, where customers can depend upon prompt and courteous attention to their requirements.

KINNEAR MFG. CO.,
COLUMBUS, O.

SHINGLE STAINS.

SHINGLE STAINS need no introduction. The artistic effect produced by their use is well understood, as well as their preservative properties, when they are scientifically made.

Shingletint represents the highest results yet attained in the manufacture of Shingle Stains. It possesses great penetrative and preservative qualities and prolongs the life of the shingles by retarding decay, at the same time imparting an artistic finish.

We can supply Shingletint in the following colors, which are indicated by numbers for convenience in ordering:—

No. 10 — Buff.	Price — 60 cents per gallon (all colors). Barrel packages free.
No. 20 — Dark-red.	
No. 30 — Light-green.	All smaller packages charged for at the customary prices.
No. 40 — Brown.	
No. 50 — Red.	Always order by number.
No. 60 — Dark-green.	
No. 70 — Light-gray.	
No. 80 — Black.	
No. 90 — Moss-green.	

In using Shingletint care should be taken to keep the contents of the package thoroughly stirred up, and if any settling has occurred that shaking will not overcome (and it is always safest to assume that this is so) a stick should be inserted in the package and the Stain thoroughly stirred from the bottom until the solvent and pigment are perfectly mixed.

While one coat of Stain will impart an artistic finish to the shingles, two coats are desirable on account of the greatly increased durability of the finish, the cost of the second coat being not more than half that of the first, so that it will readily be seen economy dictates a second coat.

In view of the fact that Shingletint is the finest goods of its class in the market, our liberality in the matter of price should cause it to be universally used.

The foregoing are all beautiful soft tints that cannot fail to please, and what is still more important, they will retain their color.

The covering capacity of Shingletint depends upon the manner in which it is used. If brushed on, a gallon will cover 160 square feet, one coat, while 1½ gallons will cover the same surface two coats. From 2¼ to 2½ gallons is sufficient to dip 1,000 shingles, and less than a gallon more is enough for a brush coat in addition after the shingles are laid. It is not necessary or customary

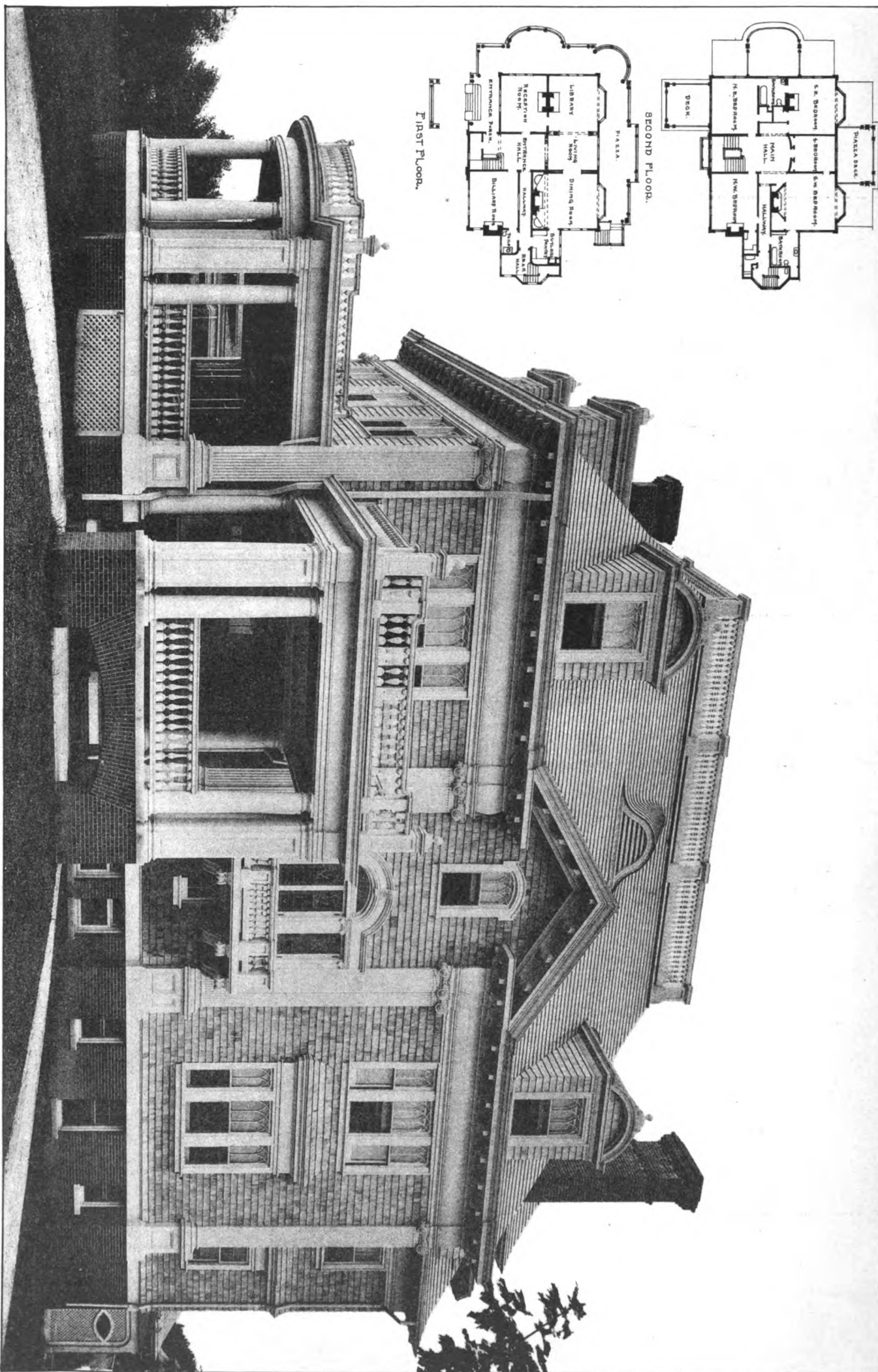
in dipping shingles to cover more than two thirds of their length.

We have ready for mailing, samples of wood treated with Shingletint and will gladly mail a set free, upon application.

BERRY BROTHERS, Limited,
DETROIT, MICH.

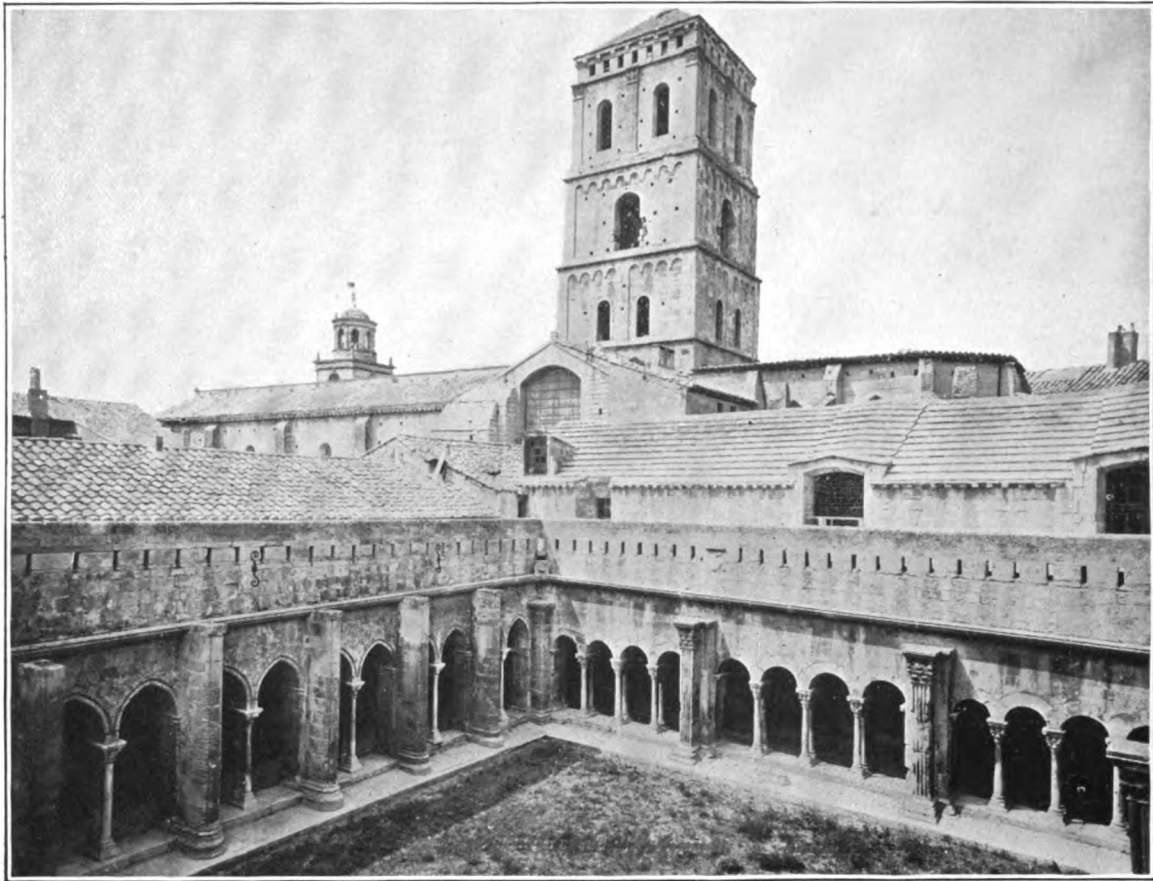
THE Berger Mfg. Co., of Canton, O., are using just now a private mailing-card which has much the air of being made in China and so appears to be a sign that this enterprising firm is quite up-to-date and issuing war-maps of the Chinese difficulty. In reality the particular illustration is merely a reproduction of a fragment of a "crazy-quilt," and forms an illustrated object-lesson of the folly of mixing styles in decoration, a text, as it were, from which may be inferred the more artistic result that is likely to be derived through the use of "Berger's Classical Designs" when it comes to applying decorated stamped-metal plates to either wall or ceiling.

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HOUSE OF A. G. HYDE, ESQ., LARCHMONT, N. Y.
LUDLOW & VALENTINE, ARCHITECTS.

WILLIAMS, PHOTOC. CO. BOSTON

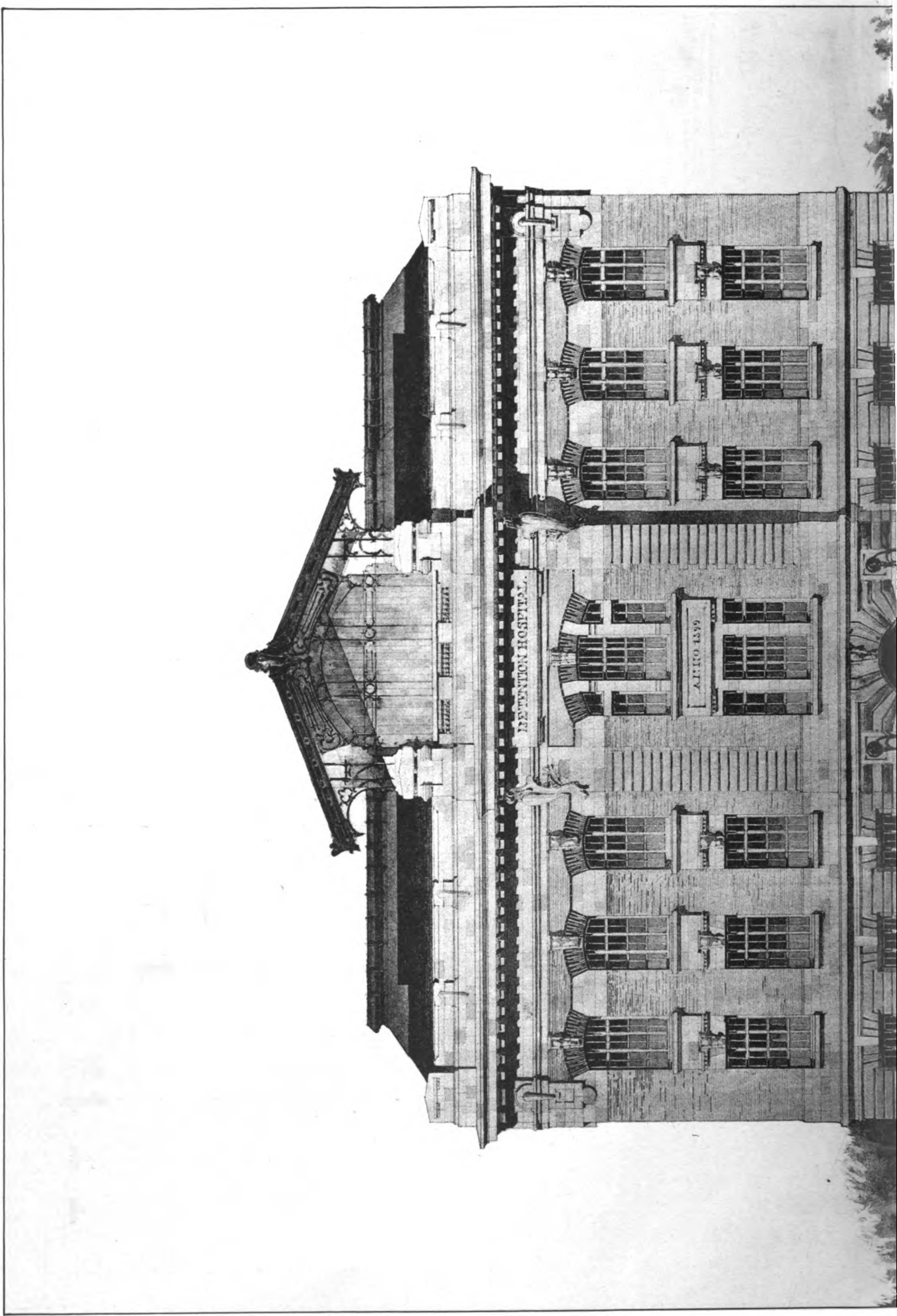


ST. TROPHIME, FROM THE CLOISTERS.



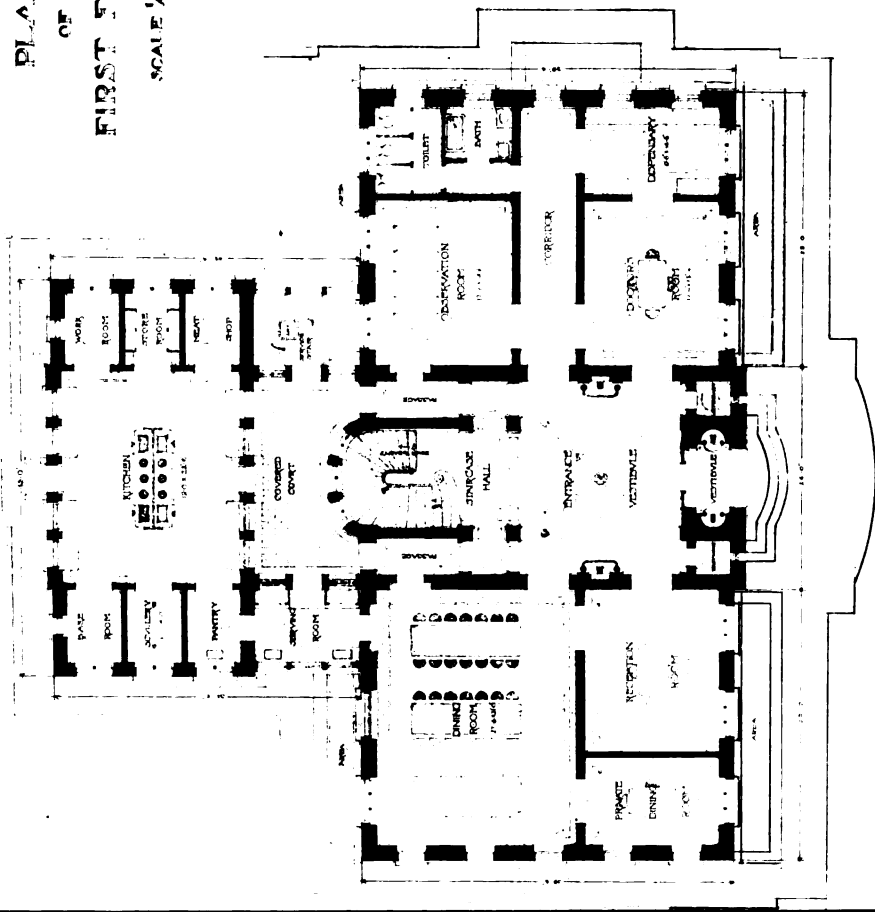
THE ROMAN THEATRE.

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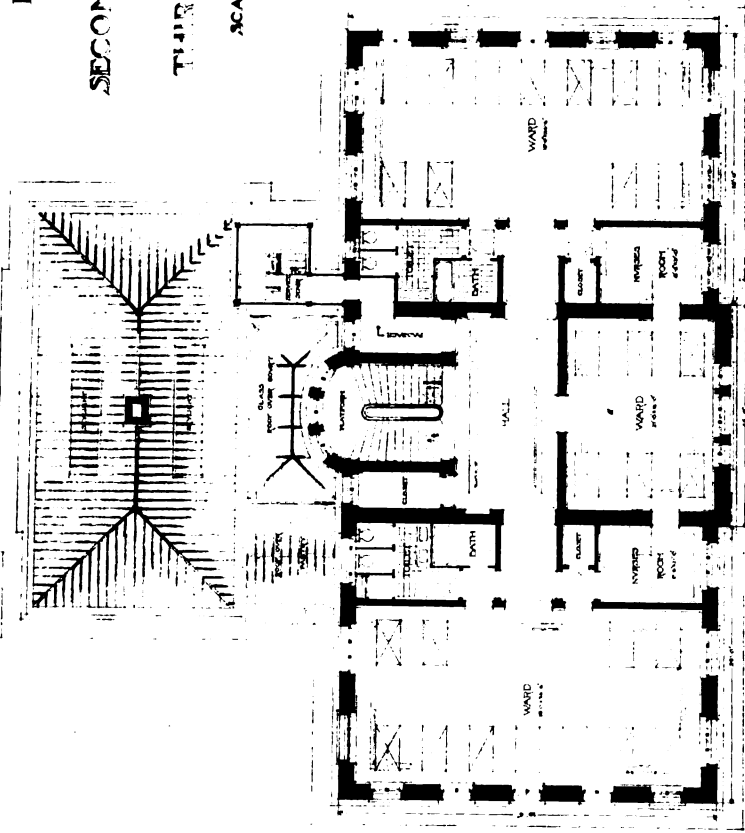




PLAN
OF
FIRST FLOOR
SCALE 1/8" = 1'



PLAN
OF
SECOND FLOOR
AND
THIRD FLOOR
SCALE 1/8" = 1'



DETENTION HOSPITAL.
J. H. FREEDLANDER, ARCHITECT.

ILLUSTRATION COURTESY OF ARCHITECT

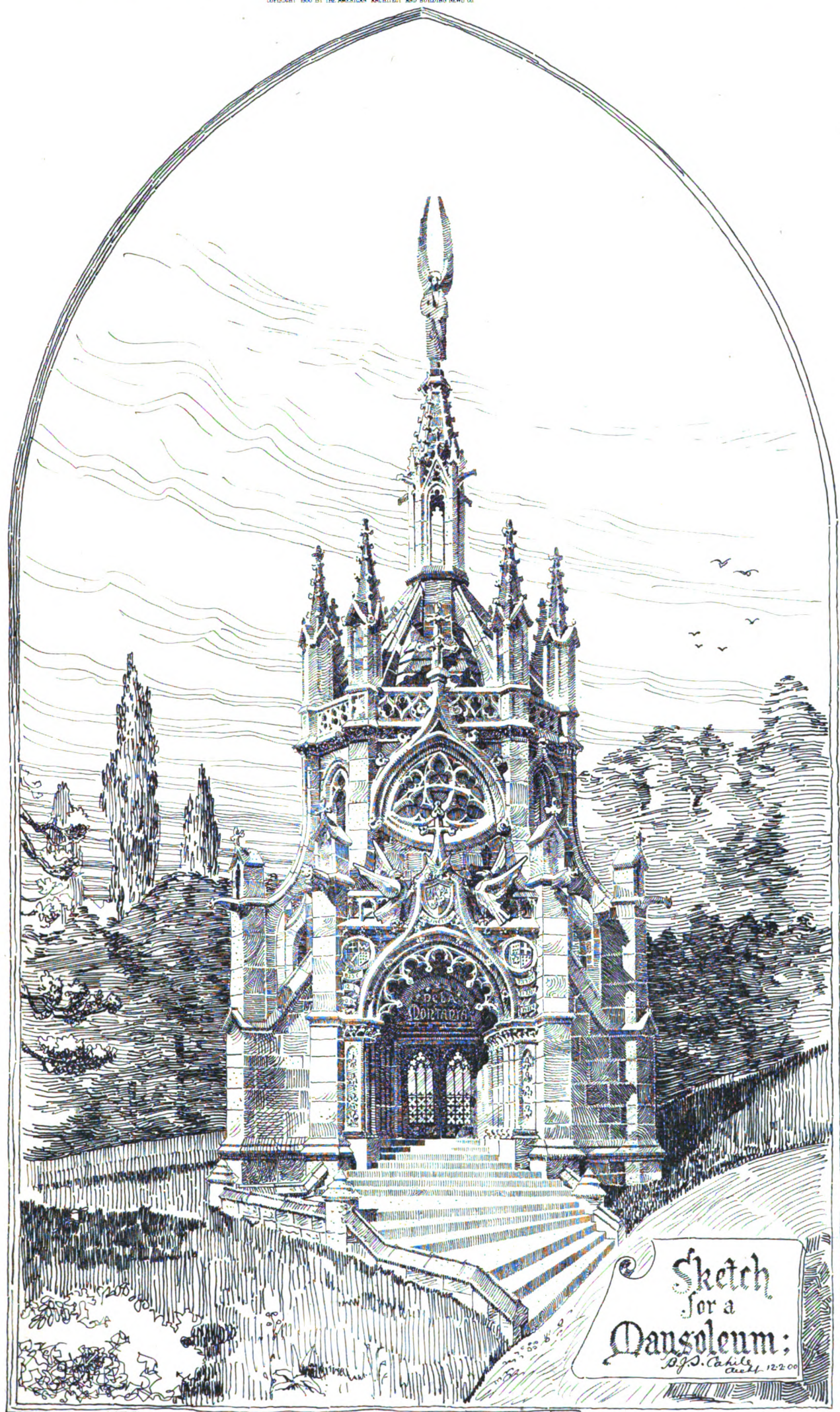


EXTERIOR OF THE ARENA.



GENERAL VIEW TAKEN FROM THE ARENA.

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Sketch
for a
Mausoleum;
J.S. Child
Arch. 12200

MEZOTYPE PRINTING CO. BOSTON

Atlas PORTLAND CEMENT

The Standard American Brand.

Used Exclusively in the Following New York Buildings:

HAVEMEYER STORES	SINGER BLDG.
ST. PAUL BLDG.	UNIVERSITY CLUB
AMERICAN SURETY BLDG.	N. Y. LIFE INS. BLDG.
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JOHNSTON and PRESBYTERIAN ELDGS.	
AND MANY OTHERS.	

Atlas Portland Cement Company

143 LIBERTY STREET
NEW YORK

TO THE TRADE.

THE line of boilers and radiators we manufacture is the result of long experience and a careful consideration of all the problems connected with the warming of a modern residence or business building, together with a thorough knowledge of the difficulties to be overcome by the steam or hot-water fitter in constructing a heating apparatus suitable to modern requirements.

A simple and easily understood construction has been the object of our efforts, and we are certain that in this, as in all other respects, we are far ahead of our competitors. In variety of sizes of the same construction we offer the trade what they cannot get from any other maker. Our sizes provide for all the needs of the trade from the small water-heater to the largest steam-boiler needed for heating purposes. In water-heaters we have sizes ranging from 100 square feet of radiating surface to 10,000 square feet in single units, and by arranging a battery of two or more units, a capacity for any purpose can be supplied.

In steam-boilers our sizes range from 300 square feet capacity up to 6,000 square feet in single units and to any increased capacity by connecting two or more together.

Our construction is arranged with the idea of utilizing to the fullest extent the forces of nature for the production and diffusion of heat, simplicity in construction and ease of management. Efficiency and economy have had our closest attention in all our efforts to manufacture a complete and perfect line of goods.

One of the most important features of our boiler construction is the system of movable flue plates by the aid of which the boiler may be adjusted to suit the draught of the chimney. These plates may be changed any time after the boiler has gone into use; in fact, they can be taken out while the boiler is in operation. We have so constructed our sections that every part is exposed to the action of the fire or heated gases.

The method of connecting the sections of a boiler or radiator with Push Nipple Joints is the best to use, no matter how the question is considered. We further make the statement that this joint is now more universally used for high-pressure steam work than either the flange or screw joint. All locomotive, marine and factory steam-boilers are put together with a joint which is practically a Push Nipple Joint. All boiler flues are expanded into the heads and a joint is made by pressing both surfaces close together. This joint has been passed upon by the most skillful engineers as a perfect joint. The only difference between the Expanded Joint and the Push Nipple Joint is that one is squeezed

in while the other is pressed out; both are iron to iron or steel to iron as the case may be. The fact that nearly all power boilers in use are now run at high pressures, from 150 to 250 pounds, settles the question as to the durability of such joints.

Our ratings are conservative, as a close examination of our lists will easily demonstrate. All sizes of fire-box, heating-surface and floor-space are clearly given, so the fitter can use his own judgment in selecting the size boiler he requires.

We do not make plans for heating-plants, as we have confidence in the ability of the heating trade to do this work for themselves, and as we are relieved of this burden we can put these goods into the hands of the trade at the lowest possible price consistent with good work.

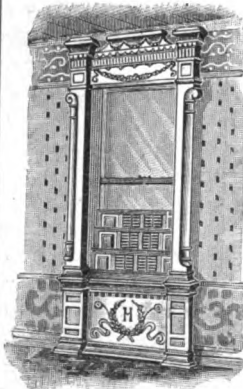
We manufacture our heaters at two different plants, for the purpose of being in the best position to serve our customers. One plant is in New York, and one near Pittsburgh. At the bottom of each price-list, the point of shipment of the boilers is indicated, so our customers can order from the plant nearest to their place of business. This distribution of plants enables us to ship goods promptly and with low rates of freight. Each plant has a series of numbers that designate the goods it manufactures so no confusion can take place in regard to orders for repairs.

J. L. MOTT IRON WORKS,
NEW YORK.

HARTMAN SLIDING-BLIND.

THE Hartman Sliding-blind Company, of Crestline, O., are making Sliding-blinds that should interest architects. They are made in three sections, each moving independently.

They can be readily attached to any window-frame and as readily removed.



They slide up and down in the window-frame like an ordinary sash and remain in any desired position, being held in place by means of concealed springs.

They are made in three or more parts and in different widths, according to the window to be furnished.

There is no unpleasant rattling, no tearing and destroying curtains and draperies, nor interfering with plants or flowers on window-sill.

The manufacturers will be pleased to send 100-page catalogue for six cents in stamps.

HARTMAN SLIDING-BLIND COMPANY,
CRESTLINE, O.

THE BEST BOILER.

AFTER deciding whether to put in a steam or hot-water heating-apparatus, the next question is which is the best boiler. The vital part of steam or hot-water heating-apparatus is the boiler, for upon the boiler depends the success or failure of the apparatus; therefore, in selecting a boiler three points should be considered: economy in fuel, length of time the boiler will run without attention, and its durability.

In the Gorton Side-feed Boiler we have a special form of construction that will meet all these requirements. It has a reservoir for coal on the outside of the boiler, away from the fire, which is at a convenient height, so that all the coal-pockets can be as easily filled as an ordinary kitchen range. By having this reservoir located on the outside of the boiler, the coal feeds down into the fire just as it is required, thus keeping a bright, sharp fire over the entire surface of the grate all the time.

The boiler is at the proper distance above the grate, so that there is ample space between the top of the fire and the boiler for perfect combustion of the gases, which gives greatest economy in fuel. The grate is set in what we call a fingered ring, which allows the air to be drawn through it after the grate is covered with ashes, so that the grate does not require shaking or cleaning only morning and night in the coldest weather. Therefore, the Gorton Side-feed Boiler will maintain a steady, bright fire much longer without attention, and give greater economy in fuel than any other boiler.

The boilers are made of steel, the shell being $\frac{1}{4}$ inch thick, of 50,000 pounds tensile strength, and the heads $\frac{1}{8}$ inch best steel, and they are thoroughly tested before leaving the factory, thus ensuring safety and durability. This is a great advantage over cast-iron boilers, for this boiler will not crack, whereas a cast-iron boiler, on account of the unequal expansion and contraction of the iron, will and does crack. This fact is proved by the argument used by manufacturers of cast-iron boilers, "that cast-iron sectional boilers should be used, because of the ease with which a section can be replaced when broken"; but they forget to add that the cost of a new section, and putting same in place, is about one-quarter as much as the cost of a new boiler.

It will, therefore, be seen that the Gorton Side-feed Boiler is the best and most economical boiler to use for steam or hot-water heating.

GORTON & LIDGERWOOD CO.,
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AGENTS AT BOSTON: WALDO BROS., 102 Milk Street.



One of the bath-rooms shown in the new H Catalogue of the Ideal Manufacturing Co., Detroit, Mich., ready for distribution about July 1.

NOTES.

AMONG the really interesting buildings at the Paris Exposition are the great glass-and-iron greenhouses on the banks of the Seine in which the horticultural exhibits are housed; they are even more interesting than the great Horticultural Building of Chicago's World's Fair fame. But one does not need to go to world's fairs in search of attractive forms for those structures in which Nature's most graceful and fragile creations are intended to grow and flourish. More than one firm in this country devotes itself to designing and erecting greenhouses, hothouses and conservatories in many ingenious and often graceful forms and of every variety of size and cost. Amongst these we may mention the Lord & Burnham Co., of Irvington-on-Hudson, N. Y., whose lately issued catalogue contains, besides

sectional drawings of hothouses of various shapes and how they are heated and ventilated, many photographic views of the conservatories built by the company for many of the richest men in several different parts of the country.

A WHITE enamel suitable for exterior work has long been sought for but never until now obtained. Harrison Bros. & Co., Inc., Philadelphia, Chicago and New York, have succeeded in producing one and have placed it on the market under the name of "Weather-proof" White Enamel. It is designed for use on outside work, such as deck-houses and hulls of ships and yachts, store-fronts, etc. It is equally good for iron or wood surfaces, will not check, crack or flake under the most severe exposure to all weather conditions; specially well adapted for use in salt atmos-

phere and localities where acid or alkaline vapors abound. Soot and smoke do not readily adhere to it, or if they do, they can be easily removed by simply flushing with water, when the enamel will be found brilliant and intact. Its great features which make it economical to use are: ease of application, free flowing, great body and spreading capacity, property of hardening clear through, whiteness, brilliancy and durability.

THE Ludlow Saylor Wire Co. have just completed a large factory, adding largely to their facilities for the manufacture of their goods and especially for all grades of wire cloth. Their "Perfect" Double Crimped cannot be excelled, and for mining purposes they simply ask a trial order to demonstrate its excellence.

the Theatre was the artistic centre of ancient Arles; for the two columns of African or Carrara marble still standing in place, the carved fragments of the stage walls, as well as the numerous sculptures and decorations now in the Museum, all show details and motives of the best imperial epoch. Here also was found one of the treasures of the Louvre, the famous Venus of Arles. As a whole, the Theatre is now so ruined that it seems hardly possible that some 1,600 people could once be accommodated within its walls; but even in its dismantled state the fragments on the spot and the sculptures of the museums show without possibility of denial that this building was one of the most artistic creations of the Roman emperors. Though surrounded by house-walls that are far from picturesque, it still possesses an air of Greek elegance and refinement seldom seen in Roman work.

From the Theatre we passed through the little crooked Rue du Cloître, showing in its upper part the Gothic entrance to the cloisters of the Cathedral, and then, after passing the walls of the old Bishop's Palace, found ourselves in the Place de la République and before the *chef-d'œuvre* of French Romanesque sculpture, the porch of Saint Trophime. Provençal tradition has it that Saint Trophime was sent to Arles by Saint Peter himself, and that he built the first church on the site of the Roman prætorium. However that may be, it is known that a portion of the present church was consecrated in the year 606, and that the portal and part of the cloister were erected in the twelfth century, possibly by the famous crusader Raymond IV, Count of Toulouse and St. Gilles. The porch seems to have been erected shortly after 1152, when the sacred bones of Saint Trophime were removed from the great burial-ground of the Aliscamps and placed in the Cathedral.

The portal is simple in general form, but was intended to express far more than an ordinary stone entrance. Its deep recess, its wide frieze, and sculptured panels present a picture of the last judgment with a vigor and realism that only firm belief and loving regard could produce. The central figure of Christ seated in judgment, surrounded by the symbols of the four apostles and a double arch of angels, fills the upper part. Immediately below is a broad frieze of figures, portraying the twelve apostles with a group of saints on one side and the punishment of condemned sinners on the other. The entire frieze is so designed that rhythmic action and architectural effect are preserved in a remarkable degree. Below are short columns, resting on the backs of grotesque animals; while in the square niches formed between these columns stand large statues of saints, separated and enriched by bands of conventional ornament. The figure of Saint Trophime in bishop's costume is perhaps the most interesting of these large sculptures. The great importance of this decorative composition was evidently appreciated when first designed; for it is raised on a simple basement approached by a broad flight of steps, — an arrangement which gives great dignity to the whole composition.

In the dim recesses of the nave the plain stone vault and walls could hardly be distinguished in the late afternoon light, but we could see that the monastic simplicity of its barren spaces was quite in accord with the nave of the old church at Aix which we had visited earlier in the day. Passing through the dark aisles, we climbed a long flight of wide steps, and came at once into the quiet enclosure of the cloisters, famous for their symbolical carvings and picturesque architecture. Here the constructive and decorative arts are happily combined. But the fading light prevented more than a walk around the vaulted passages and a rapid glance at the bold carvings of the corner piers. So, arranging with the old *conciërge* that we should return the next day to listen to his quaint stories of the saints and heroes under his charge, we stumbled out through the dark church, and, after turning a corner or two, took refuge for the night in our hotel.

And refuge it really was; for the night before the Fourth, or rather the Fourteenth, had already begun, and only adventurous spirits dared to brave the dynamite crackers and serpents that exploded in unexpected places or chased the daring pedestrian with a fiendishness and velocity that defied resistance or escape. The practical joker was abroad; and nothing suited better than the filling of an open shop with countless sparks and deafening explosions or the scattering of quiet café groups by means of the erratic serpent. Every man was an enemy for the time being. Shutters were closed, doors barricaded, and only blank walls exposed to the wandering fire-works that shot around the Place du Forum. At last, after venturing out a short way, the risk of burnt clothes and singed hair drove even Americans within doors; and we retired for the night with visions of the entertainment promised for the morrow — the military parade, the entry of the bulls, the bull-fight, the evening concert, dance on the boulevard, and costumes of *les Arlésiennes* — sadly confused with the towns and buildings we had seen during the day.

Three days spent in sketching and tramping around Arles failed to exhaust its architectural treasures; and the hours spent in drawing the details of the cloister and the fine fragments in the Museum went quickly by. But, although we visited many interesting sections in our journey up the Rhône valley, across the Cevenner, and down the Loire and Seine to Paris, our first day among the old Provençal towns was unique, because the unexpected and the unforeseen combined most happily to give us one of the busiest and most instructive days of our summer tour. — E. B. Homer, in the *Technology Review*.

January 1, 1900.

WASHINGTON, THE CITY BEAUTIFUL.



Industries diverses: Decoration, Paris. MM. Toudoire and Pradelle, Architects.

It is always interesting to read the histories of great cities, little worlds within themselves, which have so much to do with important events all along the line of human thought and progress. And to the studious and investigating mind, it is profit and pleasure to trace the structural history of a large city, as far as possible.

As a comparatively slow grower the capital of the United States, Washington, may be considered as a fair example. This now beautiful city will in 1900 celebrate the removal, in 1800, of the

seat of government from Philadelphia to its present home. Congress convened for the first time in Washington on November 22d of the latter year date, but some time before this the future Capitol had been planned and had begun, in a very small way, its architectural progress, but the "city," at that early date of its existence, was principally "on paper and under vegetation." We get a fair idea of the city at that time from the following, written by a member of the Sixth Congress:

"Our approach to the city [Washington] was accompanied with sensations not easily described. . . . Instead of recognizing the avenues and streets portrayed in the plan of the city, not one was visible, unless we except a road with two buildings on each side of it, called New Jersey Avenue. The Pennsylvania Avenue, leading, as laid down on paper, from the Capitol to the President's mansion, was then, nearly the whole distance, a deep morass covered with alder-bushes, which were cut through the width of the intended avenue during the ensuing winter.

"Between the President's house and Georgetown a block of houses had been erected, which then bore (and do now bear) the name of the Six Buildings. There were also two other 'blocks,' consisting of two or three dwelling-houses in different directions, and now and then an isolated wooden habitation; the intervening spaces, and, indeed, the surface of the city generally, being covered with shrub-oak bushes on the higher ground, and on marshy soil with either trees or some sort of shrubbery. Nor was the desolate aspect of the place a little augmented by a number of unfinished edifices at Greenleaf's Point. . . . There appeared to be but two really comfortable houses in all respects within the bounds of the city, one of which belonged to Daniel Carroll, and the other to Notely Young.

"A sidewalk was attempted in one instance by a covering formed of the chips of the stones which had been hewed for the Capitol. It extended but a little way and was of little value; for in dry weather the sharp fragments cut our shoes, and in wet weather covered them with mortar. In short, it was a new settlement."

Before the ceding back to Virginia of a considerable portion of the territory given by that State to help make the District of Columbia, the latter was ten miles square, including in its periphery a part of the Potomac River. This broad stream now forms the western (Virginia) boundary of the District, while the northern, eastern and southern boundaries stretch to the Maryland line, the whole encompassing an area of about seventy square miles.

When President Washington, with Major Pierre Charles l'Enfant, surveyor, and Andrew Ellicott, on March 29th, 1791, rode over the "ten miles square," on a tour of inspection of the site selected for the capital, the land for the latter was occupied principally by farms, although two subdivisions — Carrollburgh and Ham-burgh, both without improvements — had been laid out (the latter in the western part of the future city's site) in 1770 and 1771, respectively. Among these farms were those of Daniel Carroll, Notely Young and David Burns, who owned a large portion of the land upon which the city now stands.

There is little record of the farmhouses of the two former of these "original citizens," — as quoted above, they were the most comfortable houses "in all respects" seen in Washington just after its founding — but, until five or six years ago, the ancient domicile of David Burns could be seen, at the foot of 17th street, near the river. It sat amidst old trees in spacious, brick-walled grounds, which also contained (and still contain) the Van Ness mansion, built by General John P. Van Ness, who married Burns's daughter, Marcia.

When the old Scotchman (Burns) was persuaded by President Washington to sell the greater portion of his property — consisting of about six hundred acres, and extending east from directly south of the White House to the Patent Office site — his beautiful daughter became heir to a great deal of money. In 1802 her father

died, after which she married the handsome and dashing Van Ness, then a Member of Congress from New York. He was a high liver, believed in progress, and, with part of his wife's wealth, built the big house spoken of above.

This now weather-beaten, but still solid, old structure was in its day one of the finest mansions in the United States, and, of course, one of the most expensive. Its hospitality was famous; wealth, wit, and beauty gathered there, time flew by to the sound of music and dancing, and the old Scotchman's dollars paid for feasts that were of the highest order in those days of feasting and merrymaking.

The Van Ness mansion was the first in this country in which both hot and cold water were carried by pipe to all the chambers. In its basement were the largest and coolest wine-vaults, and in one of these, it is said, President Lincoln was to have been concealed had the original intentions of the conspirators, by whom he was assassinated, been carried out. The house cost \$75,000, and the plans for it were drawn by Latrobe, then architect of the Capitol.

The excellence and beauty of the plan of Washington is due more to the engineering genius of the old Frenchman, Major L'Enfant, than to any other. In this he followed the work of Le Notre in Versailles, the seat of the French Government buildings. The street-plan, as carried out, divides the city into quarters, known as Northwest, Northeast, Southwest and Southeast. The Capitol was to be considered the centre of the city, and radiating from it are North, South and East Capitol Streets. These, with a line of parks, running west from the Capitol, form the dividing lines. The streets run in cardinal directions, and with these are the avenues, which run diagonally, and which bear the names of various States, principally of the original thirteen. At the intersection of streets and avenues are many small parks and triangular spaces, not a few of which contain statues standing amidst beautiful foliage, and two of the parks — Lafayette and Franklin — are very large, occupying whole squares.

From the grand scale upon which L'Enfant drew the plan of Washington, it is evident that he was looking into the future with prophetic eye, believing that in time a very queen among the cities of the world would sit in all her present grace and beauty on the banks of the historic Potomac. And so he bent his clever mind to the task, and endeavored to carry out, as far as possible, the scheme of making a city, as conceived by him. His was a forcible character, not easily daunted by obstacles, a fact amply attested in his treatment of an "original citizen," who, after he had sold his land to the Government for use as part of the capital, tried to obstruct progress in the latter. This man was the Daniel Carroll already mentioned. After his land was disposed of at good profit, he determined to erect an imposing brick mansion, which he did without reference to the future thoroughfares of the coming city. Some time after the house was built, L'Enfant came along with his surveying outfit and found that Mr. Carroll had put his new domicile right in the middle of New Jersey avenue, as — only a short time before work was begun on the house — laid down on the engineer's map. Without hesitating, L'Enfant ordered Carroll to get his property out of the street. At this, "Daniel Carroll, of Duddington," a mighty man of those days, told the engineer to run his avenue in another direction, and refused to comply with the request. And so matters rested, until one night, not long after the meeting of the two strong-willed men, the Carroll house was, at L'Enfant's order, taken out of the way of the avenue. Shortly after this the famous old engineer lost his position under Government, and Mr. Carroll had his house erected at public expense in another place in the city.

It will be seen from the foregoing that very little architectural progress was made in the building of the City Beautiful up to the time of commencing the Capitol. A portion of the district, which is now a part of the city (Georgetown, West Washington), was a city in itself long before the District of Columbia was thought of; but when Rock Creek, which once divided the two cities, was crossed, going eastward, the city of Washington — when its greatest structure was begun — began in a forest and ended on all sides pretty much in the same condition.

DE FRIEZE.

VAN DYCK AT THE ROYAL ACADEMY. — III.



N this third and concluding paper will be briefly noticed the works belonging to Van Dyck's English period, 1632-1642, in which may be placed many of the best and not a few of the worst paintings in the late Exhibition. Among these latter are several which bear his name, a fact tending to prove their unauthenticity; since Van Dyck so seldom signed his pictures that only some fifteen or twenty are believed to bear his genuine signature; in all other cases where it exists it has been added by another hand.

About one thousand works are attributed to him, and undoubtedly he worked with amazing rapidity; but in his studio he was largely assisted by pupils, two of whom were really good artists named David Beck and John de Reyn, his fellow-countrymen. Their taste and ability he cultivated so highly that their works could with difficulty be distinguished from his own. They were well remunerated, and remained with their master until his death; making many copies for him to which he would add here and there a touch. Reyn, though a fine artist, was too timid to stand alone, and gladly remained in obscurity. While speaking of Van Dyck's studio, it may be mentioned that he kept by him a Fleming who made for many of these

English pictures beautifully carved frames in the Italian style, so contrived as to cast no shadow on the painting they surround.

Turning to the undoubtedly genuine works, among the earliest is the unquestioned masterpiece lent by His Majesty the Czar to the Antwerp Exhibition last year, and graciously sent thence to Burlington House — "Philip, Lord Wharton." This canvas, 40" x 52", is inscribed "St. Ant. Vandike, Philip, Lord Wharton, 1632, about ye Age of 19." It is in a high state of preservation, even for the pictures housed in the Hermitage, St. Petersburg, and has only been mellowed by time, and one can scarcely believe it to be nearly three centuries old. Delicacy joined with manly dignity are well depicted in this charming three-quarter-length portrait. Over his olive-green doublet is slung a golden-brown cloak; in the fingers of his left hand he holds a staff, terminating at the top in three prongs. In the "Hermitage" catalogue this staff has been called "an implement of agriculture" and "an implement of war." This picture, exquisite alike in its composition, in the winsome grace of the young man, and in its subdued coloring and high finish, has irresistibly charmed all beholders. The Wharton collection of family portraits, including those of Charles I and his Queen, especially painted for the young nobleman, was purchased by Sir Robert Walpole, afterwards Lord Houghton, whose son Horace says he "paid a hundred pounds for the full-lengths, and fifty for the half-lengths," and calls it "the noblest school of painting which the kingdom ever beheld," regretting that "it was removed almost out of sight of civilized Europe." This collection was valued at £40,555, but the Empress Catherine of Russia gave only £36,000, and was so disgusted at having to pay so much that the cases in which the pictures were packed were never opened during her lifetime. Lord Wharton was a zealous Puritan and a strong supporter of Cromwell. He was thrice married, and died in 1695, at the age of eighty-two.

During the early part of Van Dyck's residence in England his time was much occupied with portraits of the Royal Family, as in private galleries there exist seven equestrian and seventeen full or half lengths of Charles, and twenty-seven of Henrietta Maria, not to mention the numerous canvases on the Continent.

His truthfulness in portraiture was unexpectedly verified by Sir Henry Hallford, who attended at the exhumation of the remains of Charles I, at Windsor. He told a friend that the head was exactly like Van Dyck's portraits.

Among the royal portraits is one of the king and queen lent by the Duke of Grafton, in which both figures are charming, though the composition lacks cohesion. Charles wears a red suit, richly embroidered with white, and a broad lace collar; his left hand rests on his sword, the right being extended to take the wreath offered him by the Queen, who is dressed in her favorite white, with cherry-colored ribbons, and holds a spray of green in her left hand. As in nearly all her portraits, Her Majesty wears the famous pearl necklace, which cost the King an enormous sum.

In this portrait one has an opportunity of contrasting the stronger and more self-reliant character of Henrietta Maria with the weak and deceitful one of Charles. The Queen's French vivacity and bright eyes give an impression of beauty with which she was not really endowed, and it is said that it was to hide the thinness of her hair that she wore it in those little curls round her forehead so familiar to us. The most charming, probably, of all her portraits is that lent by Lord Lansdowne, in which the brilliant flesh-tints and the pearl-white satin dress form a scheme of color which Van Dyck seldom surpassed. From the bracelet on the Queen's arm is suspended a ring; this picture was sold at Christie's in 1842 for 500 guineas, having been brought from Italy two years before.

As a fine example of dramatic and intellectual composition, the double portrait of "Killigrew and Carew," from Windsor Castle, stands almost unrivalled. Killigrew was the son of the Queen's Chamberlain and Page to the King; he accompanied Charles II in his exile and was made Groom of the Bedchamber after the Restoration; he wrote several plays. Carew was a Gentleman of the Privy Chamber and also wrote many sonnets, besides a masque which was performed at Whitehall in 1663. Both figures are dressed in black with white slashings, and are seated at a table. Killigrew has a peevish expression. Carew, with his back to the spectator, is showing a paper to his companion. These two wits had a famous dispute before Mrs. Cecelia Crofts, to which it is supposed the picture alludes. The artist was interested in his subject and evidently dashed it off at once. "No assistant has touched these delicately modelled faces, these wonderful hands, or even the draperies, into the execution of which the painter has put his whole strength."

This picture was acquired from a dealer early in the last century by Frederic, Prince of Wales, from whose collection it passed into that of his grandson, George III. Pepys, in his diary, 1667, says "Tom Killigrew hath a fee out of the wardrobe, for cap and bells under the title of King's foole or jester and may revile and jeere anybody, the greatest person, without offence." In another work from Windsor, we have the portraits of George and Francis Villiers, sons of the favorite of James I, whom he created Duke of Buckingham, and who was murdered by Felton. This canvas, 49" x 59", is one of Van Dyck's child-pictures, in which he showed himself both sympathetic and masterly. The two boys stand in a very natural attitude, facing the spectator; the young duke in crimson dress, his crimson cloak hanging over his right arm — and Francis in yellow, his gloved right hand held against his breast, his left hanging at his side. The long hair falls over their wide lace collars. This picture

was painted in 1635, when Van Dyck was at the zenith of his fame. His price for it was £200, but when the time for payment came, the King was so straitened as to be obliged to cut it down one-half. After the murder of their father, Charles I promised his widow that he would be a father to them, and had the boys brought up with his own children at Hampton Court. During Charles's imprisonment at Carisbrooke Castle, these enthusiastic youths got up a rising in his behalf, but were utterly outnumbered and routed in a lane between Surbiton and Kingston, Surrey. Francis, the "beautiful Lord Francis," set his back against a tree, and, neither asking nor receiving quarter, fell with nine wounds in his face and body. The oak is his monument, and bears his initials to this day. His brother, the Duke, escaped and became the favorite of Charles II, being distinguished for his wit as for his profligacy. His name is indicated by the middle letter of the word "Cabal" used to designate the infamous Cabinet of Charles II, of which Buckingham was a member; and he himself, under the character of Zimri, in Dryden's "Absalom and Ahithophel," is described as "a man so various that he seemed to be, not one, but all mankind's epitome:

"Stiff in opinions, always in the wrong,
Was everything by turns and nothing long;
And in the course of one revolving moon,
Was chymist, fiddler, statesman and buffoon,"

and died at last in an obscure village in Holland,

"In the worst inn's worst room. . . .
The George and Garter dangling from the bed."

There is a beautiful portrait of the Duke's sister, "The Duchess of Richmond and her dwarf, Mrs. Gibson," the wife of the famous dwarf artist; Henrietta Maria is also represented with a dwarf, Sir Geoffrey Hudson, who, when seven years old and thirty inches high, was served up in a pie, and presented to the Queen by the Duke of Buckingham. It is a capital picture; the Queen wearing an unbecoming black hat and a turquoise-blue dress; the grotesque figure of the dwarf is in crimson, and he has a monkey on his shoulder, which the Queen touches with the tips of her fingers.

Of "James Stuart, son of Esmé, Duke of Lennox," there are a half-length and two full-length portraits. In the first he is represented as "Paris," holding an apple, and wearing a white shirt and crimson breeches, with the usual long hair of the time. He had probably taken the part in a masque. This is, doubtless, the picture mentioned by Evelyn when in May, 1654, he visited "one Mr. Tombs' house and saw some good pictures, especially one of Van Dyck's, being a man in his shirt."

In the second, the Duke is in black satin, wearing the blue ribbon of the Garter, a star being on the black cloak over his arm. He is similarly attired in the later picture, except that he wears blue stockings and immense black rosettes on his shoes. He is here seen caressing his greyhound, which saved him from assassination while travelling in Savoy. The profound devotion shown in the dog's face could not have been surpassed by Landseer. There is great dignity and high breeding in these two paintings, and in each one cannot but notice the cruel and relentless mouth. Lord Darnley's "Lord John and Lord Bernard Stuart" (younger brothers of the Duke of Lennox), and Earl Spenser's "Digby, Earl of Bristol, and Earl of Bedford," are two splendid double portraits, which afford examples of what Van Dyck could do when painting high-born youths clad in all the bravery of the time. The two Lords Stuart wear yellow and white satin doublets, respectively; the younger brother has thrown his blue cloak back over his arm to display the superb lining of cloth of silver. The whole effect is very brilliant. Both these young men were killed fighting for the King in the Parliamentary War.

In the Earl of Bristol we see the famous George Digby, who advised the seizure of the five members, for which he was afterwards impeached by the House of Commons, while the Earl of Bedford fought on the Parliamentary side and ultimately went over to Charles I at Oxford. The countenances of both these men show that they would stick at nothing.

Three portraits of the Earl of Strafford are exhibited. In two of them he is dressed in armor—in painting which Van Dyck excelled—and holds a bâton. His watchword, "Thorough," is "writ large" on every feature of his keen and thoughtful face.

"The mysterious, uncandid expression, the refinement and dignity which make partial amends for it," are perfectly rendered in Lord Fitzwilliam's full-length portrait of him. The well-known "Strafford and his Secretary, Sir William Mainwaring," in which the Earl stands with a letter in his hand, dictating to his secretary, who intently follows his master's words, was considered by Horace Walpole to be Van Dyck's finest work, though many critics hold it to be somewhat deficient in "momentariness." The painting has been much injured in "restoration." It is said that Van Dyck was very intimate with Strafford, and painted more portraits of him than of any other man in England, except the King.

The Earl of Arundel, Van Dyck's patron, is naturally well represented in this exhibition. His refined, artistic face is very pleasing among so many of the reckless, dare-devil type, and has been treated both sympathetically and lovingly by the painter. The finest portrait is that lent by the Duke of Norfolk, in which the Earl is represented in armor softened by the large white collar. In another, Arundel rests his hand on the shoulder of his little grandson, dressed in red.

This nobleman was the first in England to form an art collection,

and it was he who brought over the famous Arundel marbles, not to mention Van Dyck himself, whom he introduced to King Charles I, and who became the founder of the English school of portrait painting.

The portrait of the Countess of Arundel shows a sensible, straightforward woman, wearing white satin and pearls, and with a fur boa on her shoulders.

It is remarkable that among all the married women whose portraits adorn these galleries only one wears a wedding-ring, not excepting Queen Henrietta Maria.

"In Van Dyck's portraits one cannot but note an extraordinary sense of the dignity and manliness, above all, of the intelligence and high breeding of his men; whether they were weak and obstinate and not to be depended upon, as Charles, or stern as Strafford; treacherous and fickle as Vitelleschi, Chief of the Jesuits; loyal, like the Duke of Richmond and Lennox, they lack nothing that marks a gentleman." The late Duke of Devonshire remarked to a celebrated critic that "the companionship of a number of Van Dycks was an education for a gentleman."

Van Dyck lived very extravagantly, and at the last, in order to restore his fortunes, he not only painted more pictures than he could really do justice to, but wasted time, health and money in the vain search for the philosopher's stone, and the hours spent in the fumes of the laboratory injured still more his weakened constitution. In the hope that he would settle down if he were married, the King and other friends looked about for a suitable lady, who was found in Maria Ruthven, who was attached to the Queen's household, and was the granddaughter of Earl Gowrie. She was beautiful and nobly connected, and her dowry was kindly provided by the King.

Two disappointments soon after this, with regard to decorating Whitehall and the Louvre, gave the finishing blow to Van Dyck's already impaired health. His friends at court were scattered or dead, the Queen was in France, the country in arms, his friend Strafford had perished on the scaffold, while he himself was an object of suspicion, and it is little wonder that Van Dyck was stretched on a bed of sickness from which he never rose, although Charles sent his own physicians, promising them a fee of £300 if they cured him. He died the ninth of December, 1641, at the early age of forty-two, at his house in Blackfriars. He was followed by a number of friends to his grave in old St. Paul's, close to that of John of Gaunt.

Archdeacon Sinclair states, in a recent letter, that "this was the origin of the burial of Presidents of the Royal Academy and other great Academicians in Artists' Corner in the present building. Any monument to Van Dyck perished in the fire of 1666, and there is no tablet or record of the great painter in the modern Cathedral. The fact of his interment is, therefore, unknown to the crowds who daily throng St. Paul's."

The following lines were written on his death by the poet Cowley:

"His pieces so with their live objects strive,
That both or pictures seem, or both alive:
Nature herself amazed, doth doubting stand
Which is her own, and which the painter's hand."

A daughter was born just eight days after he died, and it is gratifying to know that neither she nor her mother fell into poverty. Charles II granted a pension of £200 to Van Dyck's daughter.

TWO RUSKIN HALLS.

A DISPATCH from London last week announced that delegates representing organized labor in England had sailed for New York for the purpose of presenting to the labor associations of America £4,000 to be used toward the erection of a Ruskin Hall in St. Louis. The movement is a result of a desire on the part of the English followers of Ruskin to show their appreciation of the action of Americans, eighteen months ago, in founding a Ruskin Hall at Oxford. The delegates are accredited with resolutions expressing the hope that a better understanding and a warmer friendship will exist between the "two English-speaking democracies." St. Louis has been selected as the site for the proposed hall, because it is the home of Walter Vrooman, the founder of the Oxford institution. These delegates are due to arrive in New York within a day or two. Some account of Ruskin Hall in Oxford will therefore be interesting. One is just to hand from The London Times, which says:

The movement has in it a large measure of vitality, to judge by its official publications, and clientele generally. The opening meeting was held some fifteen months ago, and there are now over 1,500 students on its books. These are scattered in small groups all over the country, and its leaders appear to have infused into the movement something of the emotional intensity that is more characteristic of religious than of educational organizations. It remains to be seen how long this enthusiasm will last, and, what is more important, how far it touches the more solid elements in the class to which it is addressed.

The college proposes to teach the broad outlines of English history, and in particular the history of political and social institutions. Industrial history, trade unionism, the co-operative movement—these are some of the courses offered that have an obvious interest for the industrial classes. An endeavor to spread an elementary conception of scientific historical perspective among the rank and file of the industrial army is one which, if successful in any measure, should contribute something to guide the social endeavors of the

labor party along reasonable and legitimate channels. The programme can meet with no criticism; the methods by which it may be sought to carry the programme into effect are open to differences of opinion. Many not dissimilar attempts have been and are being made, but it is always doubtful how far the promoters have succeeded in reaching those to whom they have addressed themselves. This failure or partial failure may be due not only to the inherent difficulties of the task, but also to a lack of sympathy between teachers and taught.

Herein lies the interest and hope of this movement of Ruskin Hall, that it has gained a large measure of support from the official leaders of the trade unions; five or six of them are members of its Council. It is intended that the property of the College shall be held in trust by the labor organizations. Moreover, it is intended that those of its students who have satisfactorily passed through the courses of study recommended by its authorities shall form a general body, corresponding more or less, in their relations to the organization, to the graduates of a university, and thus shall have a share in the direction of the destinies of the institution. Provided that this connection with the working-class and its leaders can be still further strengthened and then maintained unimpaired, and that the co-operation of existing educational instruments can be secured, it seems possible that Ruskin Hall may become a permanent and useful institution in this country.

The procedure of the founders of the Hall at Oxford has not been always beyond criticism; things have been said and done in their name and in that place that would have been better unsaid and undone. It is, however, possible that in this way the movement has been dissociated in the minds of the working people from the patronage of the "superior person," and that this has been an element of attraction to those whom it is desired to reach. There can be no doubt but that some sort of a college at Oxford adapted to the needs of the workingman is an eminently desirable institution and one that contains the possibility of many useful things. No one can pass a month, still less a year, in that environment, especially if his life has been previously spent amid the conditions of a modern industrial city, without a valuable addition to his intellectual horizon. That such a possibility should be open to a far wider circle than has hitherto been the case may be, if the right people can be found to assist it, a matter for national self-congratulation. The old culture city is a Mecca to which, it is hoped, many a man may now make pilgrimage to whom it was before only a name.

The central hall at Oxford contains accommodation for twenty-five residents, and since the opening there has been no vacancy without many applications for admission. The men are all genuine artisans; they come from all parts of the country; they stay a week, a month, six months, or a year, according to circumstances. They devote their whole time to study, to the management of their hostel, and to amusement. There are no expenses of domestic service; each resident has certain household duties assigned to him, and each undertakes the more laborious ones in turn. Thus it has been found possible to provide excellent sleeping accommodation, sufficiency of food, and the use of a room as study and library, at a cost of £25 a year; tuition costing an additional £6 per annum.

The work of the colleges has been so appreciated by those who have taken advantage of the opportunities they offer, that, as has already been reported in the *Times*, an effort is being made to raise funds sufficient to found a similar institution in the United States of America. The co-operation of the British Trade Councils has been invited, and an appeal for small subscriptions has been widely circulated with every prospect of success. The source of the fund, in small amounts from the working classes, is as interesting as its object. It is hoped that the work in America will be taken up with the same (if not with greater) enthusiasm as it has called forth in this country. The gift is to be free and unconditioned, except within the broadest limits. If the Ruskin Hall in America takes root and flourishes it will be managed by Americans for Americans, and, to use the words of the leaflet circulated among the people with the object of collecting subscriptions, "every American artisan may by the study of constitutional and institutional history become familiar with the thousand years of heroic struggle, of experiment, of sacrifice and of blood, during which American free institutions were evolved by the British people and bequeathed to America as a free gift."

Simple truth as this is, it is a fact quite unrealized by the mass of American citizens. Even the educated are not infrequently prepared to deny it. The American school history begins with the story of the quarrel between the two people, and does not treat that with the philosophical detachment which a scientific historian would desire. If the Ruskin Hall in America can do anything to diffuse a realization of the fact that we are joint inheritors of a great estate, and a knowledge of the manner in which that inheritance was built up, it will contribute not a little to a good understanding and mutual appreciation between us. A public meeting is to be held on June 15 in St. Martin's Town Hall, at which the Bishop of London will preside and other prominent and representative men will be present, to speed the delegates who leave next day to convey the gift to America. Magna Charta Day is an appropriate anniversary on which to initiate a movement for the spread of a knowledge among a kindred people of the history of the growth of Anglo-American institutions.

ILLUSTRATIONS

[Contributors of drawings are requested to send also plans and a full and adequate description of the buildings, including a statement of cost.]

SKETCH FOR A MAUSOLEUM. MR. B. J. S. CAHILL, ARCHITECT, SAN FRANCISCO, CAL.

HOUSE OF A. G. HYDE, ESQ., LARCHMONT, N. Y. MESSRS. VALENTINE & LUDLOW, ARCHITECTS, NEW YORK, N. Y.

DETENTION HOSPITAL. MR. J. H. FREEDLANDER, ARCHITECT, NEW YORK, N. Y.

THE CLOISTER OF ST. TROPHIME, AND THE ROMAN THEATRE, ARLES, FRANCE.

SEE "A Day in Provence," elsewhere in this issue.

EXTERIOR OF THE ARENA, AND GENERAL VIEW THEREFROM, ARLES, FRANCE.

[The following named illustration may be found by reference to our advertising pages.]

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[Additional Illustrations in the International Edition.]

THE LIBRARY: HOUSE OF CHARLES H. COSTER, ESQ., TUXEDO PARK, N. Y. MR. W. A. BATES, ARCHITECT, NEW YORK, N. Y.

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VIEWS IN THE CLOISTER OF ST. TROPHIME, ARLES, FRANCE.

THE LAPIDARY MUSEUM, ARLES, AND SOME OF ITS TREASURES.

NOTES AND CLIPPINGS

LEAD STATUES IN PICCADILLY. — Piccadilly was formerly the headquarters of the makers of leaden figures. The first yard for this description of statues was founded by John van Nost, one of the numerous train of Dutchmen who followed William III to England. His establishment soon had imitators and rivals, and in 1740 there were four of these figure-yards in Piccadilly, all driving a flourishing trade. The statues were as large as life, and often painted. They consisted of Punch, Harlequin, Columbine and other pantomimical characters; mowers whetting their scythes, haymakers resting on their rakes, gamekeepers in the act of shooting, and Roman soldiers with firelocks; but, above all, that of a kneeling African with a sundial upon his head found the most extensive sale. Copies from the antique were also there, and had many admirers, but the unsuitableness of the heavy and pliable material was soon discovered, and after a brief existence the figure-yards died a natural death. — *The Architect*.

FINDS IN ECUADOR. — Near Manti, Ecuador, is a remarkable archaeological relic, one of the most interesting monuments in South America of an unknown and extinct civilization. Upon a platform of massive blocks of stone, upon a summit of a low hill in a natural amphitheatre and arranged in a perfect circle, are thirty enormous stone chairs, evidently "The Seats of the Mighty." Each chair is a monolith, cut from a solid block of granite, and they are all fine specimens of stone carving. The seat rests upon the back of a crouching sphinx, which has a decidedly Egyptian appearance. There are no backs to the chairs, but two broad arms. This is supposed to have been a place of meeting — an open-air council of the chiefs of the several tribes that made up the prehistoric nation which was subdued by the Incas of Peru several hundred years before the Spanish invasion. Tradition teaches with more or less obscurity that the territory now known as Ecuador was divided into several independent but allied kingdoms, and that the people reached a high stage of civilization. They worshipped the sun and the moon, to both of which they raised temples. They had a knowledge of astronomy and were skilled in other sciences and art, but they had no written language, and the only records that tell of their existence are mute monuments like the chairs described. — *American Antiquarian*.

THE AMERICAN ARCHITECT AND BUILDING NEWS.

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SUMMARY:—

- The American Bridge Company a serviceable Ally of Architects and Builders.—Trusts that have not realized "Expected Economies."—Lower Prices a Necessity for Producers no less than for Consumers.—Passenger Galleries for Steamboat Piers.—Fires on Railway Trains and how to provide against them.—Official Residence for the French Ambassador to be built in Washington.—The Equestrian Statues of Washington and Lafayette unveiled last week in Paris.—Archæological Researches in British Honduras. 9
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ILLUSTRATIONS:—

- A Competitive Design for the New York Stock Exchange Building.—Plans and Sections of the same Building.—Two Dwelling-houses, Baltimore, Md.—Apartment-house.
- The Italian Building: Paris Exposition of 1900.—The Belgian Building. Paris Exposition of 1900.
- Additional: House of Mr. F. L. V. Hoppin, Architect, No. 118 East 22d St., New York, N. Y.—Main Entrance: Judson Memorial Church, Washington Square, New York, N. Y.—Clerk's Office: Court-house of the Appellate Division, New York, N. Y.—Restoration at Ordsall Hall, near Manchester, Eng.: Four Plates. 15
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THE building interests have never had placed before them a more straightforward document or one more entitled to belief and respect than that which has just been issued by the new combination of iron and steel working plants that is to operate henceforth under the style of the American Bridge Company. When Abram S. Hewitt, as a director, puts his name to the official statement that it is to be the policy of the newly consolidated concerns that "no advance in prices will be made, but the cost of production will be reduced to an absolute minimum," and that it will, hence, "be in a position to furnish all classes of bridge and structural work at an absolute minimum of cost [to the consumer] and in the very shortest possible time," these assertions may safely be accepted by every one without questioning. When Charles M. Davis is to have charge of the operating department, architects and builders can rest satisfied with the proper and expeditious making of estimates and delivery of material on time and in good order. When the great Pencoyd Works, with its annual capacity of two hundred thousand tons, is only one out of the two dozen plants in the combination, architects can feel secure that even the largest contracts can be handled with as much speed and certainty as are humanly possible, and when J. P. Morgan & Co., Kidder, Peabody & Co., and August Belmont & Co. are interested in financing the consolidation, every one can accept it as a certainty that the new combination is formed to stay, and that it *will be possible* for it to furnish material to the building fraternity at "an absolute minimum of cost." The capacity to do so is beyond question and we earnestly believe that the existence of the will to do so is equally entitled to belief. The American Bridge Company has but to live up to the letter of its announcement and it will find that architects and builders will throw into its hands all the business it can handle, and that from this business it can derive a fair and continuous mercantile profit that will enable it to hold together for an indefinite time.

THIS bridge-building corporation, our readers will recall, is the only "trust" we have ever spoken of in terms of approbation, as one of the chief objects for its formation was the extermination of the unfair competition that the individual plants suffered through the bidding of "bridge brokers" on any and every job that came into the market, and inevitably produced and maintained a state of unsettled prices which reduced most building-operations to mere games of chance. With the new trust to rely on, architects can now talk with intending clients in such a way as to win their confidence, as no wet blanket is to an investor quite so wet as a confessed uncertainty as to the probable cost of his undertaking. As to the many other trusts, we confess to reading with pleasure that several of them have just announced that they must pass their dividends

because the "expected economies," to be effected by the consolidation, have failed to materialize. The announced economies have been effected surely enough, works have been closed, workmen have been discharged, and clerks and officials have been callously turned adrift on the world, but it has none the less proved impossible to earn dividends on the vast issues of so-called stock, and though we are ready to commiserate any innocent holders of such stock, we still welcome these announcements as presaging the ultimate downfall of these gigantic industrial swindles. Legitimate combinations created by the joining of actually operating plants and the adjunction of actual capital and live assets are well enough because they are not unnatural, but these huge stock-gambling affairs, with their uttered millions of watered stock, are quite different matters, and are distinct perils to the commercial life of the country in all its parts.

ASIDE from those trusts that have already passed their dividends, there are others that show an indication of returning sanity; that give evidence that they have discovered that their cynical disregard of the right of mankind to live is only likely to bring about their own undoing; that are already finding that in order to earn anything—quite setting out of the question the earning of dividends on the watered stock—something must be done other than the mere arbitrary marking up of prices. The sudden marking up of prices without warning may produce a large temporary profit through catching those already bound by contracts unprovided for; but, aside from the immorality of this method of robbery, it is the most ill-advised course that officials charged with producing a permanent income could adopt. During the last week there have been meetings between the members of the two great iron and steel trusts to consider the matter of prices, and a price of twenty-five dollars a ton for steel billets was agreed on, but in spite of this agreement one of the members later sold a large order at twenty-two dollars, an occurrence that seems to show that these trusts are not very strongly held together. More significant than this is the statement made by the selling-member that it was his conviction that prices had got to "come down to the lowest possible limit if business was to be hoped for," and we will add to this our conviction that they not only have got to come down, but must be kept down if any one is to derive a continuous income from the operations of the plants involved. Prosperity is to be gained and maintained only by encouraging activity in the fields where the plant's output is consumed; it cannot be encouraged through checking it by the application of factitious high prices.

THE terrible calamity that transpired in New York harbor last week has had the effect of turning attention sharply to the happy-go-lucky method under which a vast freight traffic is conducted in one of the world's greatest seaports, and the newspapers have followed columns filled with the harrowing details of the disaster with other columns equally filled with advice as to needed and possible improvements offered by editors, reporters and correspondents. One of the latter, a Philadelphia architect, comes forward with a patented scheme which occupies the pier-heads with seventeen-story fireproof buildings, the lower stories used as freight sheds, the upper as tenements, with, over all, an "esplanade" running over the roof-tops and offering to cranks and would-be suicides greater facilities for a sensational exit from life than is afforded by the Brooklyn Bridge. Doubtless much will be done to mitigate the existing dangers in the way of equipping piers with systems of pumps, pipe-lines, automatic sprinklers, and eventually the present combustible buildings will be replaced by others that are fireproof. But the danger lies less in the buildings than in the cargoes that are temporarily housed in them, which not only may be the cause of a fire through spontaneous combustion, but owing to their very miscellaneous characteristics and the manner in which they are prepared for shipment are particularly liable to ignite through the agency of spark, dropped match or cigar end. The discipline that can control those who regularly work about the piers and sheds, sailors, longshoremen and stevedores, is ineffective as applied to passengers and individuals who may have occasion to visit, on business, the piers or boats lying at them. It would seem that for the use of these classes of occasional visitors a fireproof gallery

above the floor of the piers would be a useful adjunct and one that could be added to existing piers without very great expense. The present system of landing passengers on the common floor of the pier, over which to the exit they have to make their way as best they can, dodging teams and truck loads of bales and boxes at the peril of their life, is, to say the least, uncivilized. No steamship company, apparently, would think of providing safe egress for its passengers, as its responsibility ends with placing them safely on shore, but it is curious that the thought that a match or cigar carelessly dropped by a passenger, startled out of his presence of mind by an angry imprecation from a hurrying longshoreman, might produce disaster, has not led to the adoption of more civilized methods. As men will smoke in spite of rules and regulations, a special smoking-room, where the hands at the noon hour or at each change of shift could draw a few of these consoling and refreshing whiffs, would seem to be a reasonable provision to make, and one which would tend to prevent infractions of the rule against smoking.

BUT fire is not to be dreaded only when one is shut up in a building or on shipboard, and apparatus for the escape from, or the control of, fire is needed in other places than buildings and ships. Those who have had to face a fire in a passenger-car know what is almost the extreme limit of human helplessness, and for the safeguarding of the millions who travel by rail each year the railroads should be forced to provide adequate safeguards in the way of portable extinguishers or apparatus operated from the locomotive. One of the English roads is now, because of a wreck which occurred near a station, equipping all its stations with fire-apparatus, and more than this, is adding to the equipment of its engines a powerful fire-pump and a serviceable length of hose, the needed water being obtained from the tender or from any stream or well that may be accessible. But in cases such as occurred on a Western road, where gas that had leaked from a conveyor suddenly ignited and filled the sleeper instantly with flame, an engineer might proceed for miles without knowing he was drawing behind him a burning car, for an engineer is normally looking out ahead and has no eyes to give to the train behind him. For such cases as this and for the equally dangerous, but more common, mishaps of a train breaking in two, it would be well to enforce the general adoption of a device in use on one of the railways in India, a device which is both adequate and so cheap that the most parsimonious directorate could hardly object to its adoption. The device is simply a mirror attached to the outside of the locomotive cab and adjusted at such an angle that in it is reflected the entire length of the train behind, so that the engineer, without leaning out of his window and turning his head to assure himself that his train is all right, can ascertain the fact by a glance at the mirror so momentary as not to interfere with his outlook ahead.

THE French Chamber of Deputies has just taken a step in which interesting potentialities are involved, since it sets an example that, if followed, may have a material effect in adding to the architectural interest of the city of Washington. The Chamber has voted a credit of something over two hundred and fifty thousand dollars for the purchase of a site and the erection thereon of a suitable official residence for the French ambassador. In nothing is our political system more democratic than in the manner in which our own officials are housed, they being, with the exception of the President, left to house themselves as best they can in leased or purchased private houses, and foreign officials, perhaps feeling called on to adopt the fashion of the country, have done the same thing, so you may find a foreign embassy housed in any sort of a house, hotel or apartment. Some ambassadors temporarily own the buildings they occupy, but none, we believe, has ever built one to suit his official needs. But if France set the example and the result prove to be officially satisfactory and artistically interesting, other embassies are not unlikely to follow suit, and if each country should have its building designed in the style in vogue at home, and if these official residences should be built as neighbors in the same quarter or upon the same square, Washington may acquire a permanent exhibition of "foreign pavilions," which will lend a perpetually "Midway" air to the neighborhood, and country visitors will regularly take it in as one of the sights that must not be overlooked. Then, too, as this country is jealously reciprocal in its international dealings, and, when a foreign minister is transformed

into an ambassador, responds by a similar transmogrification of this country's official representative, our architects may expect shortly to have a chance to design an official residence for our ambassador in Paris, but under an appropriation probably much larger than that the French Chamber has just voted, and later there will be further employment in designing similar houses for American democratic simplicity in London, Berlin, Rome, Vienna and elsewhere. The possibilities that can be evolved from this beginning are interesting and it will be amusing to discover what scheming architect first succeeds in getting a bill before Congress nominating him as the architect selected to design the first official home for an American ambassador abroad. The French, unfortunately, have a rather scornful way of thinking that anything in the way of a statue or a monument is good enough to set up in a foreign country, and they may have the same feeling as regards buildings, and so, in place of erecting in Washington a building which will really add to the architectural adornment of the city, they may entrust the work to some one of the designers who have created the architectural nightmares that now house the Exposition of 1900 in Paris.

THE people of this country, we are happy to say, seem inclined to pay attention to the eternal fitness of things and, when they undertake to respond in kind for any favor or honor done them by a foreign country, endeavor to entrust the execution of the symbol to hands that are really capable and intelligences that are really cultivated. Proof of this is to be found in the equestrian statues of "Washington" by Messrs. French and Potter, and of "Lafayette" by Mr. Bartlett, that have just been unveiled in Paris, the first the gift of the Daughters of the Revolution, and the second paid for by contributions from the school-children of the United States, the general Government contributing appropriations more or less large, so that the statues do have some real significance as a token of national amity. Judged by the illustrations that have come to hand, the Washington group is the more satisfactory of the two, though it has at the same time more of the elements of the commonplace than has the other; that is, it has more the air of a portrait-statue from the life, and has not the effect of being the result of a pure effort of the imagination—aided by half remembrances of other statues, which is the main impression one receives from the "Lafayette." Bartlett's work is disappointing in that it seems to be largely made up of unrelated parts embodying too strong reminders of well-known pieces of equine sculpture elsewhere. Thus the crest, eyes and ears of the horse are distinct reminders of Frémiet's work, the forehead is the forehead of a horse of St. Mark's, the tail is the tail of the Colleoni, while the barrel and hindquarters are common to many, and rather commonplace. But it is not easy to model a horse that will not, as distinctly as this, recall in more or less of its parts statues already existing elsewhere. In the pose selected for the Marquis, the sculptor has hardly been more fortunate. It is not a common one, so it is all the more unfortunate that it should at once recall that of the statue of Etienne Marcel, only a few squares away behind the Hôtel de Ville. Considered together, these statues of Washington and Lafayette admirably present what Americans understand to be the different characters of the two men at the time their destinies made them companions: Washington, self-reliant and impressive, Lafayette, impressionable and tending to become merely a hero-worshipper.

THE investigations into the archæology of Central America, which have been carried on with zeal and success by American expeditions, have been rather interfered with by the unwillingness of the Colonial Government to grant permission for the study of the aboriginal remains in British Honduras. As much material is known to exist there, the lack of opportunity for examining and comparing the Maya or Aztec antiquities in this part of the country with those already studied elsewhere is a serious bar to the intelligent elucidation of one of the most curious problems of ethnology and history; and the President of the British Archæological Association, the Marquis of Granby, with the coöperation of some of his personal friends, proposes to organize an expedition to make explorations in the ruined city of Tikal, about sixty miles west of Belize. Being exclusively British, this expedition will undoubtedly have free access to the region in question, and the results of its work will be available to the whole scientific world.

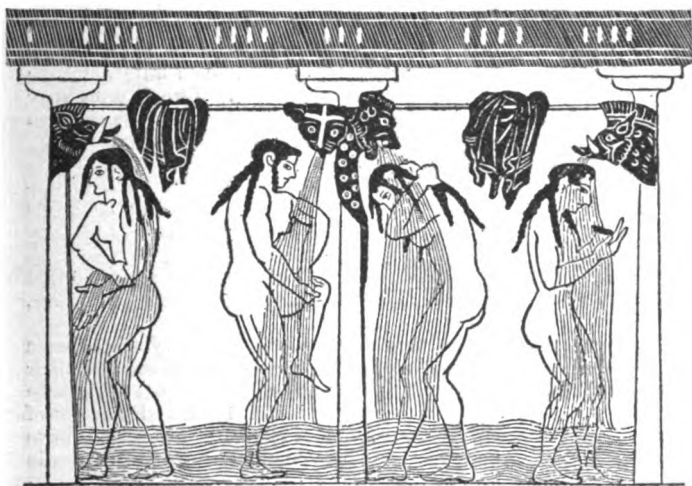
A PLEA FOR RAIN-BATHS IN THE PUBLIC SCHOOLS.¹—I.

Fig. 1. Woman's Douche-bath: From a Greek Vase.

SANITARY science teaches that infectious diseases can best be prevented by the speedy and regular removal of all dirt and waste refuse from the centres of population. This axiom applies not only to our city streets and habitations, but also to the human body. One of the functions of the skin is to continually secrete waste products from the body. During this process the outer layers of the skin are continually cast off and renewed. The clothing which civilized human beings wear forms an obstruction to the immediate removal of the dead and cast-off matter, hence the skin excretions are retained on the same longer than is desirable. The waste matters form an incrustation on the skin, are then subject to decomposition, give off bad odors, and impair the proper function of the skin. The chief reason for wearing underwear is to prevent the skin dirt from attaching to the outer clothes, but some of the dirt remains in the undergarments until these are sent to the laundry. Bacteriologists have discovered in such clothes not only dirt and layers of the skin, but also many bacteria and disease germs. It is obvious, then, that both the skin of persons and their underclothing need frequent cleaning, the one in the bath, the other in the wash.

Among the chief causes of air contamination in school-rooms are, first, the lack of bodily cleanliness of many school-children, and second, dirt accumulated both in the pupils' underwear and also in their outer garments.

Ventilation of rooms is usually understood to comprise means for the removal of foul air and for the introduction of a sufficient quantity of purified air, warmed during the winter season, and admitted in such a way as to avoid any draught. I assert, however, without fear of contradiction, that in school-rooms the best system of ventilation must fail to remove entirely the odors arising from unwashed bodies and from unclean garments. It is a matter of common observation that the air of a class-room can be rendered much purer by a removal of the pupils during recess and by some energetic air-flushing accomplished by opening all windows than by the best ventilating system, and this for the obvious reason that two of the chief sources of air pollution—the children themselves and their clothes—have been removed. Therefore, it follows that the above, generally accepted, definition of "ventilation" is imperfect, that something more is required than the mere introduction of pure air and the removal of foul air. What we must do in ventilating rooms or audience-halls is to remove entirely, or to keep out, all direct sources of impurities which contaminate the inside air. Applied to buildings in general, this means that plumbing fixtures, traps and pipes, which may contain sewer air, must be made free from defects or leaks, that gas-leaks likewise must be repaired, and that there must be no accumulations of organic waste matters, like garbage. In school-rooms, in particular, it points to the desirability of frequent and thorough ablutions of the children. Incidentally, it shows that it is desirable to remove from class-rooms the usual wardrobes for the overcoats, head-coverings, umbrellas and rubber-shoes of the pupils. Even where such wardrobes are provided with special ventilating-flues, the odors from a large number of damp clothes are apt to assert themselves unpleasantly. It is vastly better to arrange the wardrobes in the corridors outside of the class-rooms, or else to provide special hat-and-coat rooms for pupils near the entrance-halls of the school. The ventilation system adopted for a school-house, whatever it may be, can be a success only if all sources of noxious emanations are done away with.

The purpose of my paper is to advocate the introduction and establishment of "rain-baths" in the public schools. I do not wish to be understood as considering school-baths an absolute necessity in all public schools. Some school-buildings are located in good neighborhoods, and are attended by the children of people who are tolerably well-to-do, and in whose homes cleanliness can be, and is usually,

attained. Public schools located in the tenement districts, on the other hand, are very much benefited if some method of bathing the children during school hours is provided, for the largest percentage of the tenement-house population must go without a bath the year round. In the narrow, dark and ill-ventilated quarters which they call their "homes" opportunities are seldom afforded for thorough ablutions.

Some years ago, Dr. Hunter Stewart, of Edinburgh, read a paper entitled, "Ventilation of Public Schools," in which he suggested the establishment of "soap-and-water" baths in schools, assuring his audience that "the use of such would go far to purify their atmosphere." Dr. Oscar Lassar, one of the earliest champions of the rain-bath, asserted that the air of theatres and audience-halls generally was polluted not so much by the products of gas-illumination and the respiratory process as by the noxious exhalations emanating from ill-kept skins, and intensified by the heat due to the crowding together of many persons.

The late Sir Edwin Chadwick, in advocating school-baths, said, "Of the lessons that may be taught in the schools, the practice of cleanliness is of the highest order." In a review of the progress of sanitation during the year 1888, he called attention to new bathing-apparatus especially applicable to schools by which a child may be completely washed in three minutes. "Look at the comparative sanitary result of the washed children of a whole school," he says, "as against the common one of the fouled-air and badly-washed children. Look at the service to the poor mother who has no means of washing."

From Kotelmann's book on "School Hygiene" I quote as follows:—

"If cleanliness does not prevail in the school-room, and the air is constantly being polluted by filth, no amount of ventilation will prove sufficient. Cleanliness should extend, in the first place, to the pupils themselves. Not only ought their bodies to be scrupulously clean, but also their clothes and shoes."

"In connection with this matter, the school shower-baths introduced by the city of Göttingen deserve more attention from higher institutions of learning than they have hitherto received. For one thing they promote the cleanliness of the skin; and for another, they lead the pupil to desire clean underclothing."

These and similar observations agree entirely with those of the writer, and serve but to confirm the suggestions made in this essay.

It is a deplorable fact that the children of the poorer classes of a population, who form the largest attendance in the public schools, particularly in the elementary grades, often show an utter disregard for, and lack of, personal cleanliness. In the tenements the children usually have no facilities for bathing and keeping clean. They may wash their faces and hands daily—and this usually, too, in a hasty manner—but the feet are bathed only at rare intervals, and in many cases the main body receives no ablution the entire year. In fact, observation shows that many poor children have not the desire for a cleansing bath at regular intervals, for though we see them flocking to the free floating-baths in summer time in cities situated on rivers or near the seashore, they are attracted there solely by the wish to enjoy the refreshing sensation of the bath or to practise swimming.

Assuming, therefore, that school-baths are desirable, if practicable, the question arises: What form of bath should be used in schools? This is answered by considering the object in view, which is to afford the children inexpensive, quickly applied means for ablutions of the whole body. For such a cleansing bath, warm water and soap are required. The former loosens the outer incrustations of the skin, composed of dirt particles and epithelial cells, while the alkali of the soap cuts the grease excretions and assists in removing them.

Warm baths can be given in large swimming-basins, in tubs, and finally by means of simple sprays or douches. Swimming-basins are ill adapted for school-baths, for they are not only very costly to build and maintain, but are not intended for washing and ablutions, and the common use of the water in swimming-basins involves the possibility of the transmission of infectious diseases. Warm tub-baths are likewise unsuitable, for they are more expensive than sprays both in first cost and in maintenance, they require much more space, and a very much larger quantity of water. They also require more time in filling and in emptying, and more labor and attention to keep them clean. In the tub the bather is surrounded by dirty water, whereas in the rain-bath a constantly fresh stream of water pours down upon his body and at once flows off to the sewer. In fact, the same arguments which point to the superiority of the spray or rain baths for people's baths are applicable in their entirety to school-baths.² I may reasonably assume that some of the audience are acquainted with my former essays advocating the introduction of the rain-bath. Not the least of the advantages of the douche over the tub bath is that it stimulates the action of the skin by the mechanical effect of the drops of water, and hence renders children more active after the bath, more bright, more eager to learn, and makes them show interest in their studies; whereas a bath taken in a tub has the contrary effect, being usually debilitating. The spray-bath is both cleansing and stimulating, and if followed by a gradually colder douche subsequent catching cold may be prevented, and the body is hardened against many forms of disease.

The particular form of douche which I would recommend is the shower of tepid water from an inclined overhead rose or sprinkler-head, having a large number of perforations, each about three-thirty-seconds of an inch in diameter. The rain-bath is sometimes spoken

¹A paper by Wm. Paul Gerhard, C. E., Consulting Engineer for Sanitary Works, read at the May 7, 1900, meeting of the American Social Science Association, held at Washington, D. C.

²See the author's essays on "The Modern Rain-bath," and on "Bathing and Different Forms of Baths."

of as a modern form of bath, while others aptly call it "the bath of the future." Dr. Oscar Lassar, in an essay,¹ read at the meeting at Cologne, held on September 18, 1888, of the Association of German Naturalists and Physicians, has drawn attention to the fact that a Greek vase, recovered from the excavations at Volci, an ancient Etruscan city located near the shores of the Tyrrhenean Sea, which vase is now said to be in one of the Berlin Imperial Museums, proves that the rain or spray baths were well known to the Greeks. In a description of the new public bath-house at Breslau, Prussia, Dr. Kabierske illustrates another Greek vase, on which is represented a woman's bath, which shows clearly that the use of the inclined overhead douche was known to the ancient nations. (See Fig. 1.)

In taking the ground that the spray-bath is the best form of bath for use in public schools, I do not wish to be understood as underestimating the beneficial effect of swimming-baths. However good swimming as a form of athletic exercise may be, the school-house proper cannot be regarded as the place for practising such exercises.

The advantages of school-baths are numerous. In the first place, the school-children are offered the opportunity of a weekly cleansing-bath, which in most cases they lack in their homes. The children are readily kept clean, and this in turn, as already indicated, is a powerful help in keeping the air of the class-rooms free from disagreeable odors. In addition to the direct benefit derived from bathing there is the indirect advantage resulting from the children being taught and brought up to appreciate cleanliness. In the early summer days a dash of water from a cooler douche serves to refresh the body and to reduce its temperature. Moreover, the bathing together of many children necessarily has the effect of making them more tidy as regards their undergarments. This, in turn, cannot help exerting a beneficial influence in the children's homes, for parents will naturally strive to keep their children cleaner and their garments neater when they know that in undressing together, slovenliness of the dress, or raggedness of the underclothes due to the mother's carelessness or inattention, may reflect unfavorably upon the children. To a certain extent the bathing of children in public schools will exert a beneficial and wholesome influence in fostering habits of cleanliness among the people generally. Above all, the habit of taking baths at regular and frequent intervals, if cultivated and taught during the period of early childhood, is bound to exert a wholesome influence upon the later periods of life.

For all these reasons, school-baths may rightly be considered to be a moral factor in the education of the young. The results even extend farther, and include the betterment of their home life and surroundings.

Is it not a fact that, besides being a detriment to health, lack of cleanliness gradually leads to loss of self-respect, to bad habits, vulgarity and vice? In a measure, school-baths even help to reduce the sharp contrasts which exist between the laboring classes and the well-to-do people.

Experience teaches that a school-janitor can readily manage the bathing-apparatus and control the bathing of the boys, while the janitor's wife may take charge of the bathroom for the girls. The hour for bathing can be set so that it will not interfere with any important studies, but it is well to bear in mind not to continue the bathing during the last school-hour, in order not to expose the children to the danger of catching cold when they leave the school. A good way to avoid this danger at all times is to have the tepid douche followed by a cold douche of short duration, in order to close up the pores of the skin and to harden the body in general.

It may be asked, are not school-baths unnecessary in those cities or city districts where people's baths are maintained by the municipality? In answer, let me state that up to the present time there are not, in any city of the United States, a sufficient number of free baths for the people. In the State of New York, for instance, a law was passed in 1893 making the establishment of free people's baths mandatory, yet no free baths have been added so far to those few which existed prior to the passage of this legislative act, except in some of the smaller cities. In New York City some people's baths are now under construction; in Brooklyn no effort whatever has been made lately to erect any free baths open all the year round. Again, experience in European cities, where it has been the custom to give free tickets for the public baths to the children of the public schools, has shown that neither the children nor the parents appreciate the offer sufficiently.

Before presenting a few illustrations of plans for school-baths, let me say a few words about how the establishment of spray-baths in the public schools originated. History informs us that in ancient Greece gymnasia and swimming-baths were often attached to schools. In modern times, a few of the schools in England were provided, some with tub-baths, others with bathing-pools. At one of the large Berlin gymnasiums (high school) there is a complete swimming-bath, besides five tub-baths for preliminary cleaning. The credit of introducing spray-baths into the public schools belongs to Professor Fluegge and Mayor Merkel, both of the university town of Göttingen, in Germany.

The first trial was made there in 1885 in one of the public schools by fitting up in the basement a bath-room, 8 feet long by 16½ feet wide, an adjoining apartment of the same size being used as a dressing-room. The walls were finished with cement, and the floors asphalted

and covered with a wooden lattice floor. Three large vertical douches were installed and under each was placed a zinc pan, about three-and-one-fourth feet in diameter, and about fifteen inches high, to which a waste-pipe was attached. The douches were arranged to run simultaneously, three children being placed under each douche. The janitor controlled the mixing of the hot and cold water, and the children were not permitted to touch the valves. Two months after the baths were put in operation, seventy-five per cent of the children bathed regularly, although the bathing was not made obligatory.

Later on, the greater advantage of the inclined douche was recognized, and it was also found necessary to provide larger dressing-rooms, so that twice the number of children bathing could be accommodated. In this way the bathing of a class was quickly accomplished.

The success of the school-baths at Göttingen was so great that hygienists, school-teachers and principals, city architects and others, visited the new baths in great numbers.

The idea at once became very popular, and in a very short time a large number of German cities provided spray-baths in some of their school-buildings. I will mention only a few of these out of a large number. In Weimar they were introduced in 1886, and soon out of 1,300 children 910 took the baths. In Magdeburg four schools have spray-baths; Königsberg has two school-houses with baths. Berlin had in 1896 four school-baths, Breslau had four in 1887, and since then five more have been installed. Posen has one school-bath. Frankfurt-on-Main had in 1896 three, Hanover nine such baths, in which about one hundred thousand baths were given in six years.

Cologne has several schools so fitted up, and in Altona a large school-house has a special spray-bath pavilion arranged in the centre court between the two wings of the school-building. More recently, school-baths were erected in several of the schools of Zurich (Switzerland), also in Copenhagen (Denmark), Christiania (Norway), and in Paris. Wherever such school-baths were introduced, their success was almost instantaneous and so great that the Boards of Education decided to include baths in the specifications for all new school-buildings. At the annual meeting, in 1886, at Breslau, the German Public Health Association passed resolutions endorsing and recommending school-baths for public schools, modelled after those first introduced at Göttingen. There is not a single instance on record where the bathing arrangements placed in public schools were put out of use on account of a slim attendance.

Soon after the year 1891, when the idea of people's rain-baths was first agitated in the United States, a high-school building in Scranton, Pa., was fitted up with spray-baths under the direction of Theo. P. Chandler, an architect of Philadelphia.

In a report on "School Hygiene and School Houses," written by Dr. A. G. Young, for the seventh annual report (1892) of the State Board of Health of Maine, the German school-baths are referred to as follows:—

"The advantages of the school-baths observed in European schools are bodily cleanliness of the child, greater care on the part of the parents in keeping the clothes of the school-children neat and clean, improvement of the condition of the school-room air, again in the physical health of the pupil and the increase in the mental freshness and activity. There results, therefore, a physical, a moral and an intellectual gain. Moreover, from more than one of the towns where school-baths have been opened comes the testimony that a good reflex moral influence has been exerted upon the parents and families of the pupils.

"The manifest advantages that have come from the establishment of school-baths in the old countries render it evident that their introduction into some of our own city schools is an experiment worth trying."

In 1895, the writer published a brochure on "Bathing and the Different Forms of Baths," from which are quoted the following paragraphs regarding school-baths:—

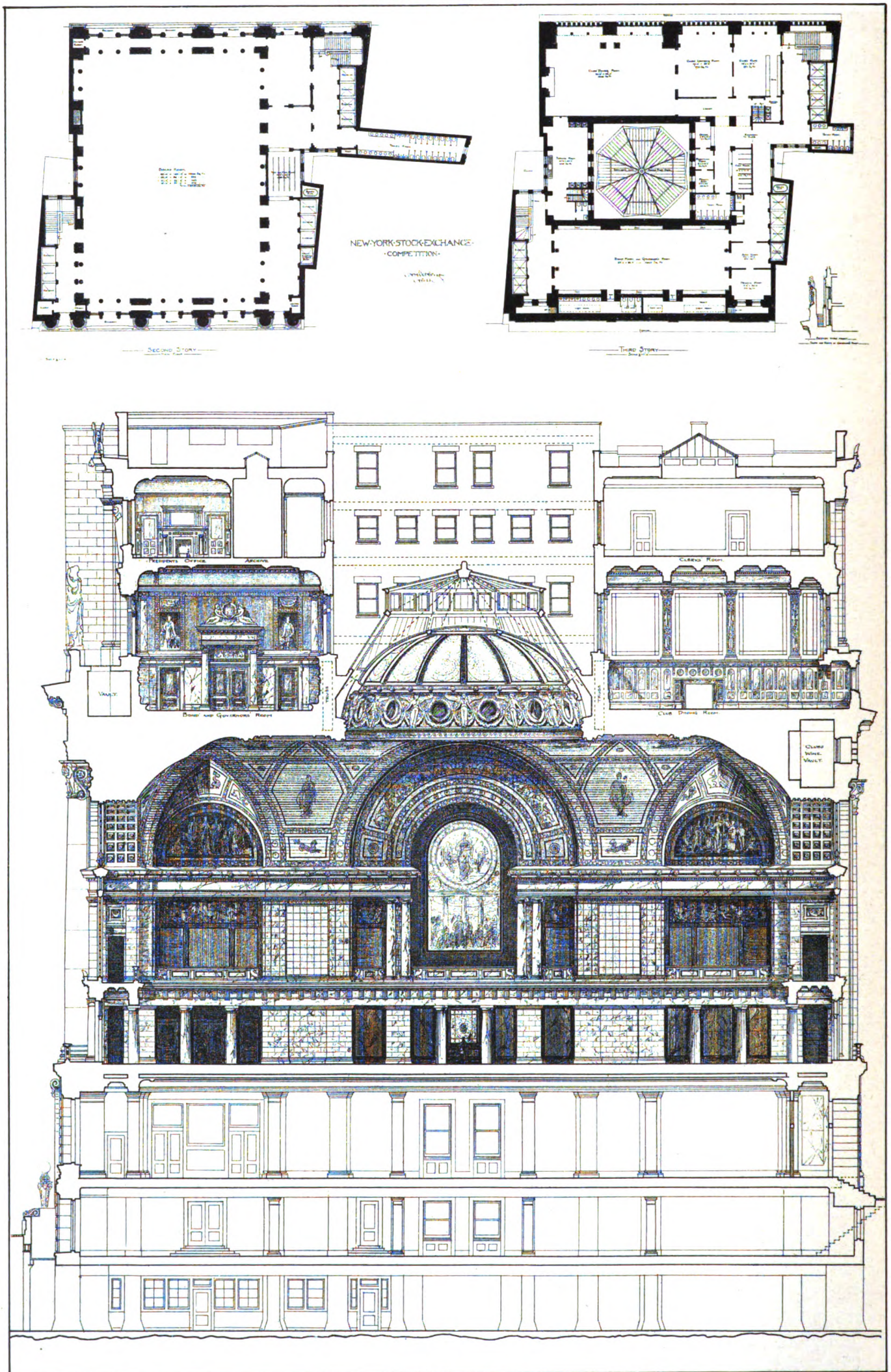
"Experience teaches that the air of the school-rooms is badly contaminated by the emanations from the children's bodies and by the odor from their clothing. All attempts to improve the sanitary condition of schools will fail to accomplish their object thoroughly if means are not provided to cleanse the bodies of the pupils. Cleanliness of school-children will make the ventilation of school-rooms an easier problem, and further than that, it will tend to increase the appreciation for cleanliness in the lower classes of population, and thus indirectly stimulate bodily—and often moral—purity in the home circle.

"The first one to suggest the advantages and the necessity for school-baths was, I believe, the late Dr. Alfred Carpenter, of Croydon, Eng. In his lectures on 'Preventive Medicine in Relation to Public Health,' delivered in 1877, he discussed the subject as follows:—

"Every public elementary school ought to have a proper washing-place, so that the children might wash the whole of the body at least twice a week, as well as their hands and face. . . Is the custom of wearing the same dirty garments day after day, getting daily more filthy, an unavoidable one? It is this custom which makes the air of rooms so unwholesome in which the lower classes of children assemble, and which frequently produces the first seed of evil in the constitution, especially when they go into the room damp from the effect of a drizzling rain. Every one accustomed to a badly-ventilated school-room knows that it is the smell from damp and dirty clothes which is the principal source of the offensive atmosphere. . .

¹ "Die Kultur-Aufgabe der Volksbäder."

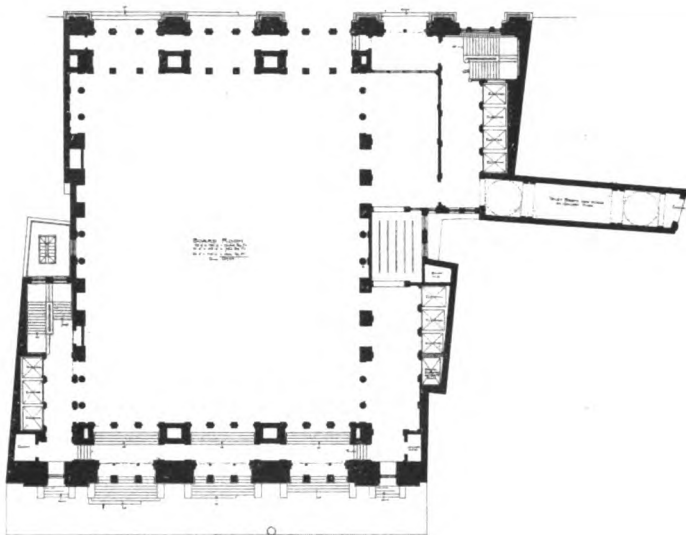
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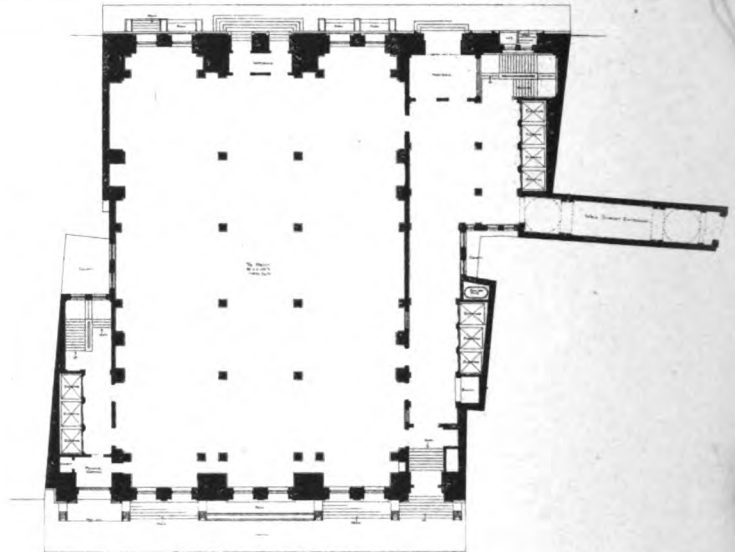
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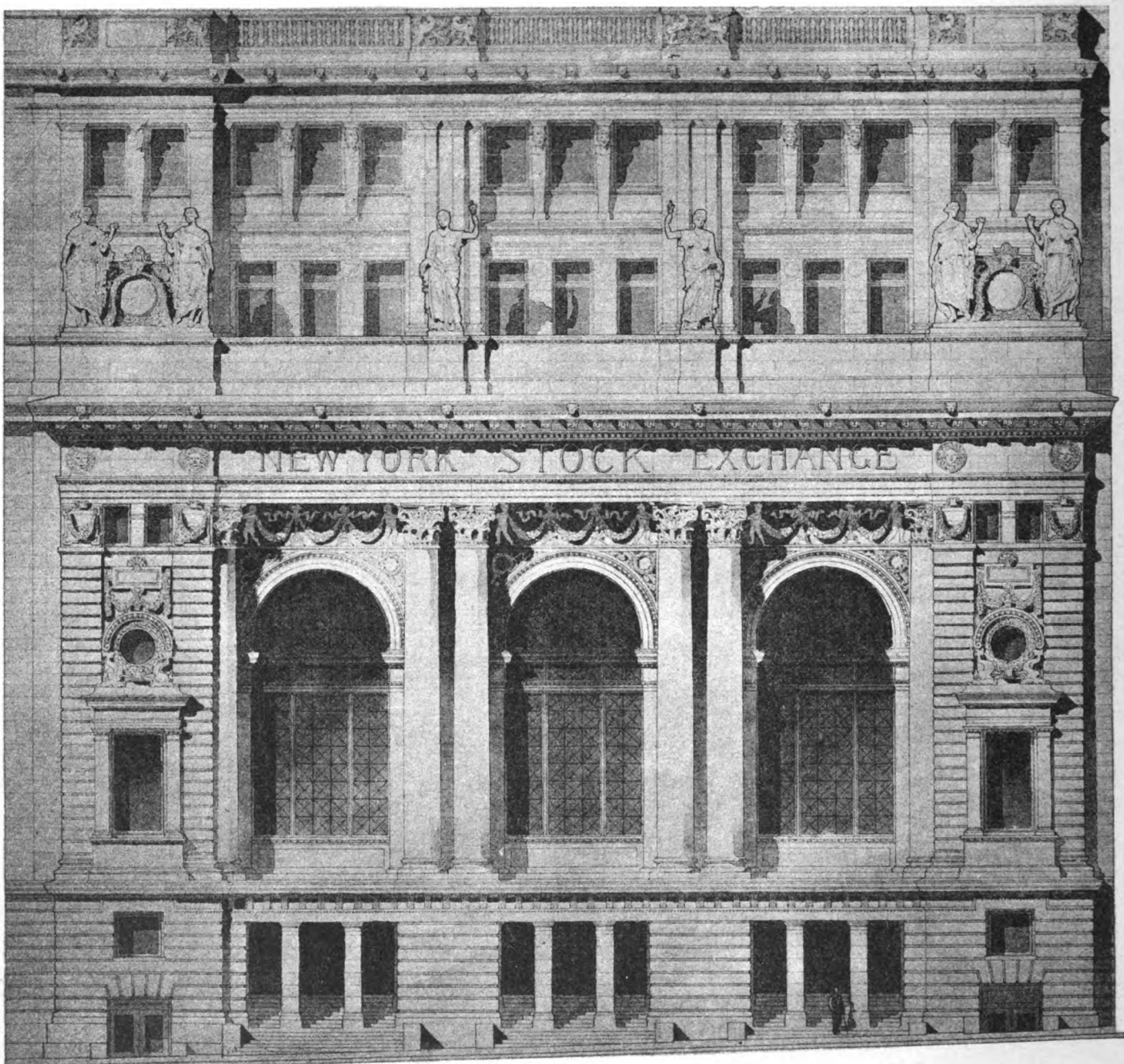
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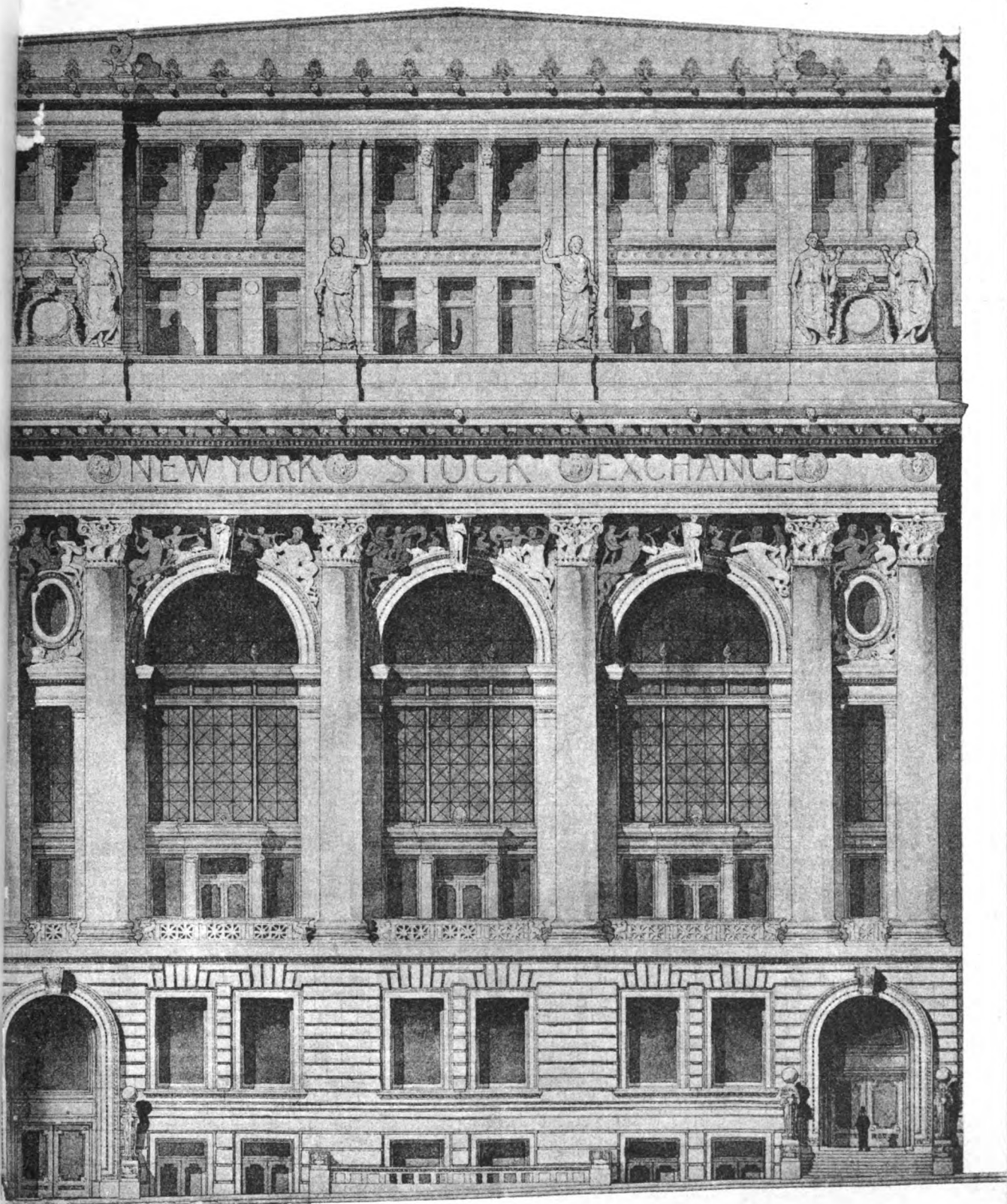


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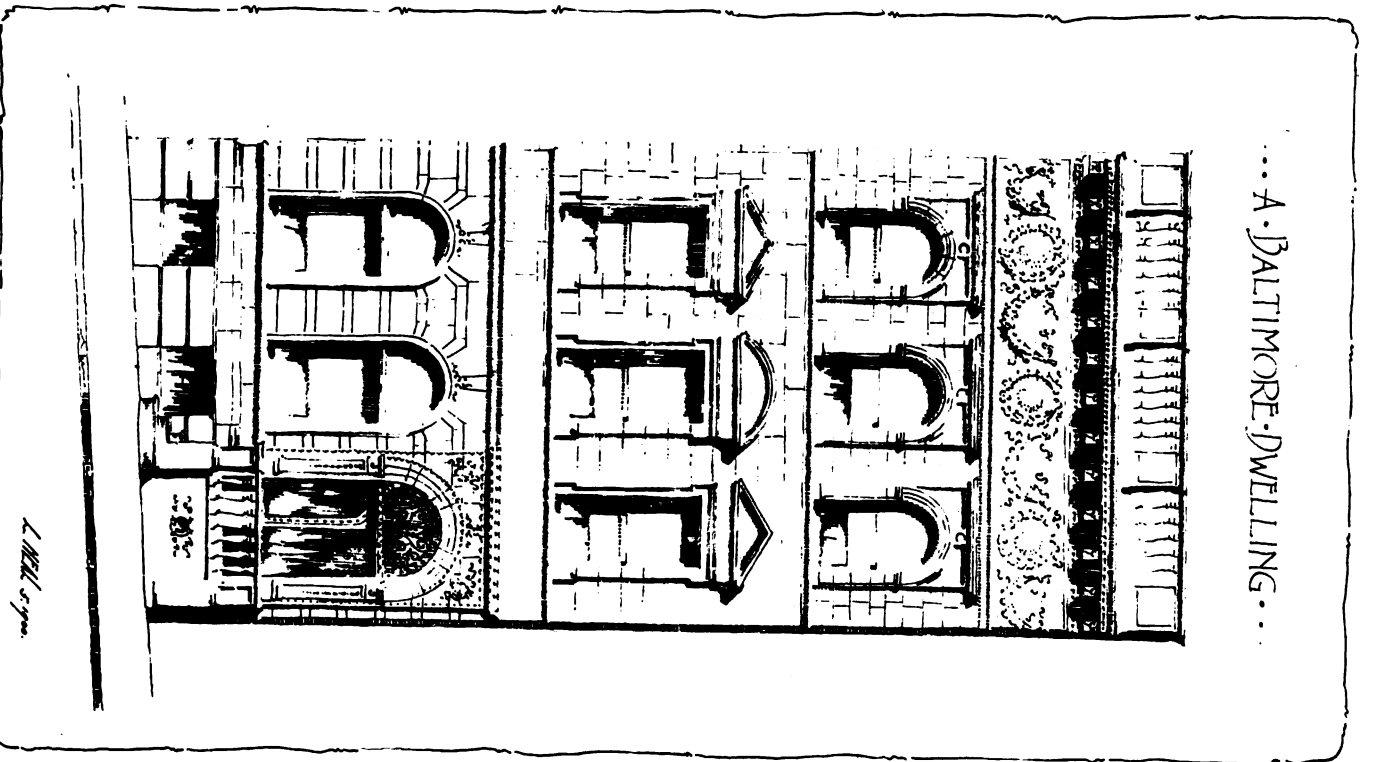
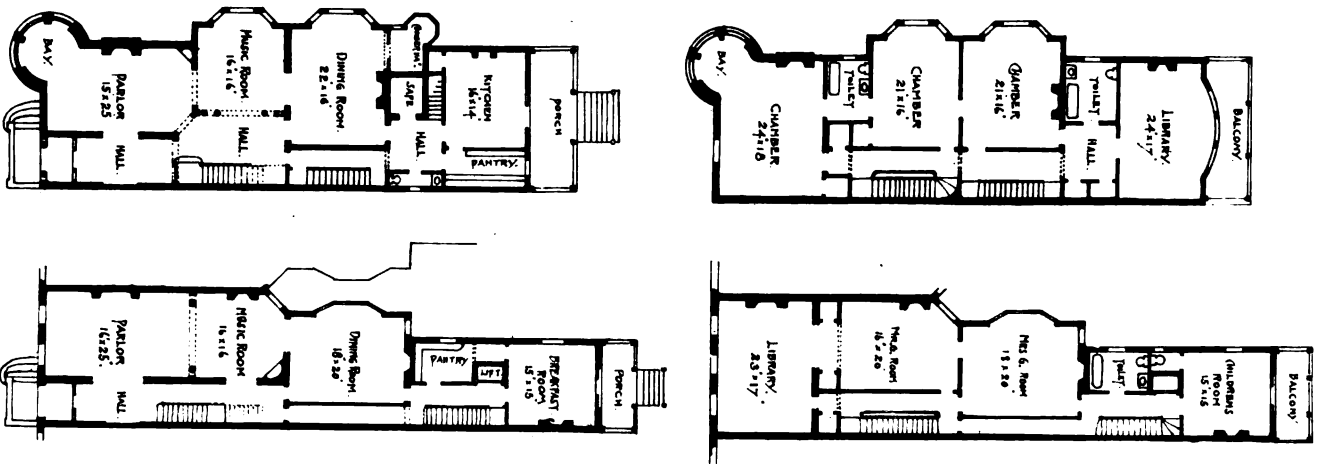
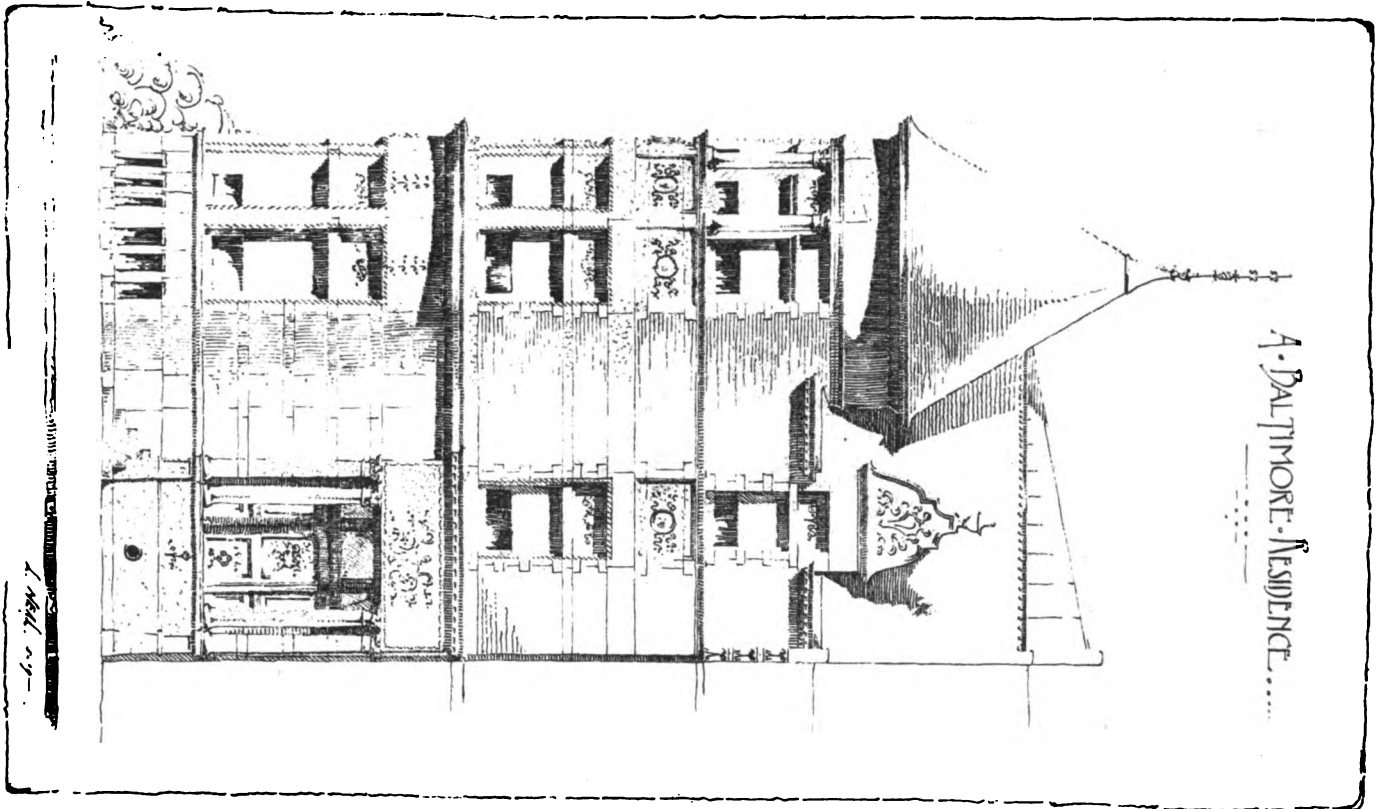
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I contend that school-baths are necessary for the education of the great mass of our poor, as much as, if not more so, than a knowledge of geography and astronomy, or even of history. It will be impossible for the people to be godly until they are instructed in the way of cleanliness. Cleanly children will acquire a dislike for personal dirt and retain it to the end of their lives. They will make more effort to raise themselves from below the level of brutes to that of Christians than they otherwise would if allowed to remain accustomed to filth. Use becomes second nature, and second nature in a century or two becomes instinctive.

"It is only by educating our poorer classes in cleanliness in early life that we shall make them, as a whole, love it for its own sake, and hate dirt and those habits which tend to make man lower than the beasts of the earth, too often now arising from an acquaintance, an intimate association with dirt and dirty homes among the poor. Poverty may be clean, and with cleanliness the first step will have been taken to do away with the evils which follow in its train, and that health secured which riches without cleanliness cannot possibly purchase."

"Of the three classes of baths, the tub-bath, the shower-bath, and the swimming-bath, the first, viz, tubs, are not well suited for schools, as a very large number of fixtures would be required to bathe all the children. The space for the tubs cannot always be found in a school-building, and the process would naturally be slow and result in serious inconveniences; moreover, tub-baths would require the outlay of a vast sum of money.

"Swimming-baths in schools would be good as far as giving an opportunity for bodily exercise is concerned. For a cleansing-bath, however, the swimming-bath is not well suited, for reasons explained heretofore, and here again the tepid shower or rain bath offers immense advantages.

"To Professor Fluegge and Mayor Merkel, of the German university town of Göttingen, belongs the credit of having first tried the experiment of rain-baths in the public schools, about the year 1885.

"Groups of children are bathed together, and care is taken not to give them the baths at the end of the school session, so that they will not catch cold in going home. After some use of the baths, it is found that the children enjoy them; that their minds become more active and more attentive; that the baths induce a better cleanliness in clothing, and particularly in the underwear; that the parents pay more attention to the cleanly and neat appearance of their children; and, finally, that the air of school-rooms is greatly improved.

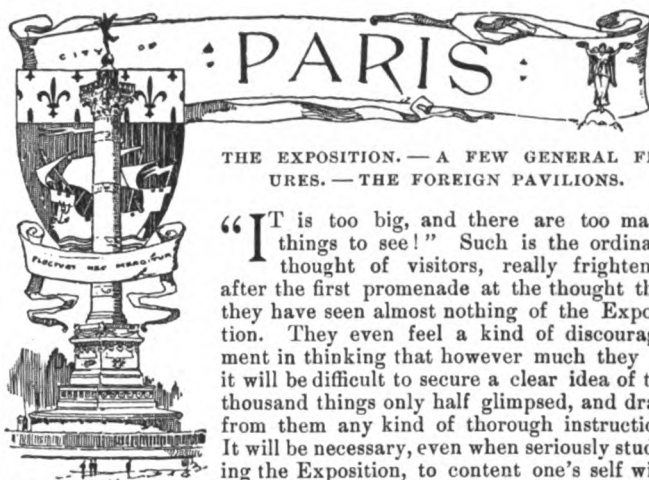
"At first, some teachers and boards of education raised trivial objections to the introduction of bathing in the schools. They claimed that the school was not the place to educate children to appreciate the cleanliness obtained by bathing; that this belonged to the family; fear was expressed lest the children would catch cold, whereas experience has proved that the bath hardens the body; others objected to the cost, claiming that people's-baths and not school-baths were required; a few finally objected to the bathing being made compulsory, whereas experience in the schools demonstrated the fact that the children all soon became eager to bathe.

"In the German schools, bathing has become very popular, and the movement is rapidly extending, so much so that recent school-buildings are rarely constructed without rain-baths for boys and girls in the basement.

"In this country there are as yet but few school-baths. One on the rain-bath principle was erected in a high-school at Scranton, Pa., a year or two ago. At Manistee, Mich., a company erected people's-baths in 1885, and one of the claims of the company was to get as many children as possible to take regular baths by distributing tickets in the schools.

"In February, 1885, a Sub-committee on Baths and Lavatories of a Citizen's Committee, in New York City, made a report, recommending the erection of people's-baths in the tenement districts, and also the equipment of public schools, where practicable, with baths in the basement, and favored the adoption of the rain-bath system, because there is no waste of water, because the cost of erection is very moderate, and because the system is characterized by cleanliness and simplicity."

[To be continued.]



THE EXPOSITION. — A FEW GENERAL FIGURES. — THE FOREIGN PAVILIONS.

"It is too big, and there are too many things to see!" Such is the ordinary thought of visitors, really frightened after the first promenade at the thought that they have seen almost nothing of the Exposition. They even feel a kind of discouragement in thinking that however much they do it will be difficult to secure a clear idea of the thousand things only half glimpsed, and draw from them any kind of thorough instruction. It will be necessary, even when seriously studying the Exposition, to content one's self with

a general impression of the whole and be satisfied with drawing from it certain general conclusions, and if this feeling is experienced by Parisians, who have all the leisure in the world to come and go as they please, all the more the provincials and foreigners, who come only to spend a few weeks — a few days, perhaps — at Paris, will be troubled in their attempt to see everything, and will be overwhelmed in the midst of this vast quantity of interesting exhibits.

In the first place, conceive that the enclosure of the Exposition contains, in Paris alone, an area of about 110 hectares, while at Vincennes there is occupied a space of almost equal size, which raises the round figure to the very pretty total of 220 hectares which must be passed over once by whosoever desires to neglect nothing.

A few figures will be interesting as conveying some idea of the importance of the Exposition. In the 110 hectares of the Parisian portion the covered area includes the following buildings:

Grand Palais des Beaux Arts.....	24,900 square metres.
Petit " " " " " " " " " " " "	6,200 " " " "
Palais de l'Esplanade des Invalides..	43,000 " " " "
" du Champ-de-Mars.....	223,000 " " " "
Buildings on the Banks of the Seine..	50,000 " " " "
" of the French Colonies....	12,000 " " " "
Foreign Pavilions.....	10,000 " " " "
Sundry Buildings.....	30,000 " " " "

If we compare the number of exhibitors this year with those of 1889, we find for 1889, for France and the Colonies, 30,982; foreigners, 25,630; total, 56,612. For 1900, France and the Colonies, 35,767; foreigners, 40,479; total, 76,246. That is, an increase of nearly 20,000 exhibitors, and, contrary to prediction, the foreign exhibitors are more numerous than the French. As for motive power, for electric lighting and the boiler plants distributing steam, the comparison for the two exhibitions gives the following results:

POWER FOR MOTION AND LIGHTING.

1889.		1900.
Number of machines.....	63.	39.
Total power.....	9,773 horse-power.	36,200 horse-power.
Average power per machine..	155	929

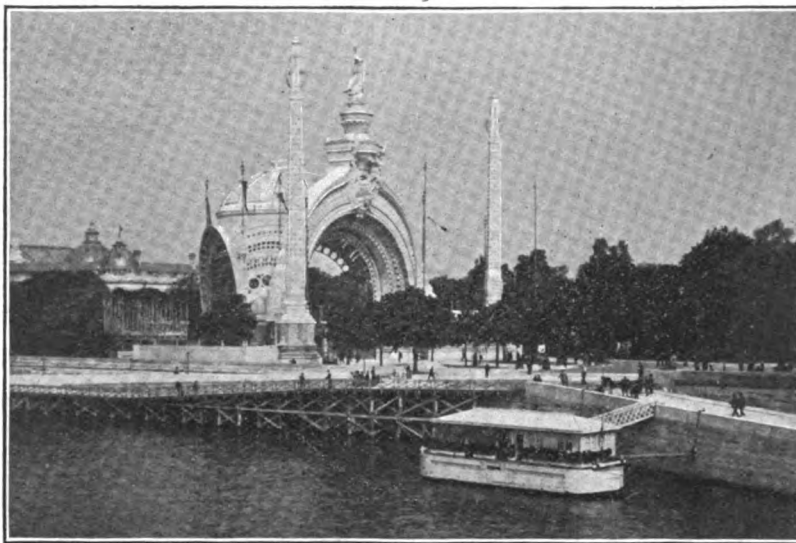
STEAM PLANTS.

1889.		1900.
Number of steam-boilers...	59.	92.
Production steam per hour.	111,100 kilograms.	238,000 kilograms.

ELECTRIC LIGHTING.

1889.		1900.
Number of arc-lamps.....	1,508.	6,100.
" " incandescent-lights..	12,700.	40,600.
	14,208.	46,700.

Or a difference of 32,500 in favor of the exhibition of 1900. Add to this the gas-lighting of the exterior of the palaces of the Invalides, the Champ-de-Mars and the Trocadéro, the acetylene-gas lighting for the foreign pavilions on the banks of the Seine, and on each



Porte Monumentale, Place de la Concorde. M. Binet, Architect.

side of the Pont Alexandre III, and it will be easy to comprehend that at night it is not difficult to see at the Exposition.

Now let us enter the Exposition anywhere, and draw our first impression at hazard. At the time I am writing this article the Exposition has been open for two months, and with some few exceptions everything is finished. This has not been accomplished without difficulty, and for six weeks the public was too often stopped by barriers prohibiting their entrance to some given pavilion, or by the dust, noise and disorder of unfinished operations. Disappointment was particularly great on account of the delay in finishing the Chateau d'Eau, which even yet has not been put in complete working order; that is, so far as regards the illuminated cascades which are to be one of its chief attractions. But the public had so many things to see that its regrets were kept in check by its admiration, and even in front of the buildings which were not yet occupied by exhibitors it was well enough pleased with admiring their architectural treatment.

When comparing the buildings erected by the French with those erected by foreign architects, the mind is drawn to one thing. The foreigners have more often than not made reconstructions of ancient monuments, exactly reproduced or ingeniously reduced and combined. The French architects, on the other hand, in their administrative buildings, have rather sought a fantastic style; if not always a new one, one not recalling, at any rate, any given classic monument. They have sought to be decorators rather than architects, and, through inspiring themselves only through their own ingenuity, some of them have achieved really charming results. Such has been the case this year with M. Paulin, architect of the Chateau d'Eau, and M. Hénard, author of that delicious silhouette, rich in filigree-work and light, which crowns and encloses the Chateau d'Eau.

Seeking novelty, the French architects, in constructions so hastily studied, must, of course, expose themselves to severe criticism, and some have not been spared. They have "treated their architecture like confectioners and pastry-makers"; they have been accused of bad taste and compared to their disadvantage with the marvellous architecture of the foreign pavilions. This manner of judging is unjust. The artist who seeks can more easily deceive himself than he who reproduces a given work already built and of known repute: he deserves, at least, the respect due to an effort. This is the case with the French architects, who, in spite of some errors, due to an excess of imagination, have given proof of ingenuity, intelligence, elegance and a charming fancy. And then, it must be said, the task is not easy. At this moment we are passing through a period of transition, which brings it about that in all the arts we find ourselves face to face with several opposing manifestations; some do not try to depart from the dry and routine-bound paths of classic art, others are too eager to get out of them and so fall into eccentricity. The most reasonable, desiring to preserve a just medium, have not

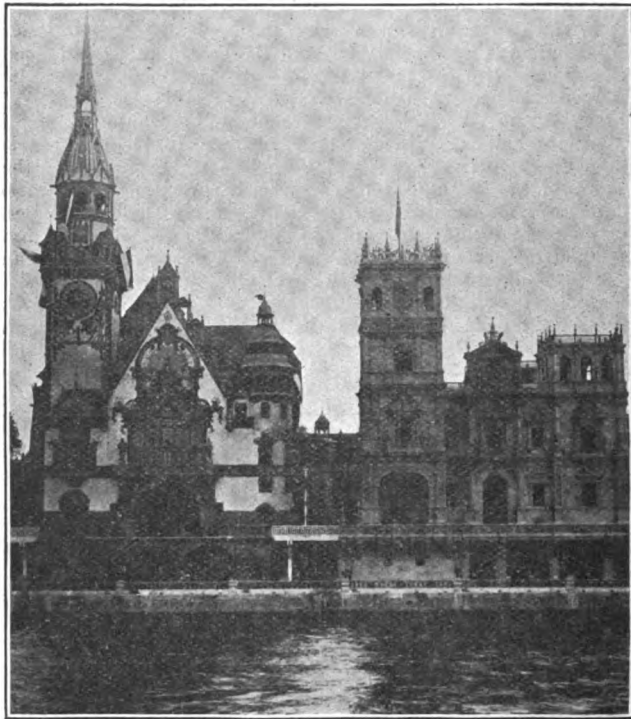


Chateau d'Eau. M. Paulin, Architect.

yet altogether cast off the academic formulas, nor have they known how to apply the principles of their classic education to the accomplishment of the new problems which they impose on themselves. Consequently, we arrive at a lack of equilibrium, an absence of cohe-

sion between the parts of a building, in a word, at "*hors d'échelles*" which are often shocking.

We shall find the proof of this theory in the Grand Palais des Beaux Arts, on the Champs-Élysées. The main façade on the



German Building. Herr Radke, Architect. Spanish Building. Sr. Uriosta y Velda and M. Marcel, Architects.

avenue is composed of a grand central portico, with, on the right and left, colonnades of fine appearance, excellent proportion, and decorated with a very beautiful frieze by M. Edouard Fournier, executed in mosaic. This very classic façade, which does not include any new element of construction, conceals an immense interior nave, composed of iron trusses of great span, of great height, and crowned by a circular dome, also in iron, the entire roof being glazed. Here there are new elements of construction; the materials suggest new forms incompatible with the classic lines of the façade. So, while from a distance regarding the general effect of the palace, the observer is troubled, without quite knowing how to account for it, by the effect of this mass of glass crushing the façade and having with it no apparent relationship in style or epoch.

This injurious effect of glazed domes over façades of classic architecture is one of the rare bits of criticism which, although in a much less degree, can be aimed at the Petit Palais des Beaux Arts, by M. Girault. Here there is still something to seek, something not yet found. The shrewdest have, wherever possible, concealed their glass windows behind attics, balustrades and decorative pediments. Up to the present time this is the most satisfactory solution, and with this treatment the architects of the palaces on the Esplanade des Invalides and the Champ-de-Mars content themselves.

The great effort is shown in the study of decoration, and from this point-of-view the palaces of MM. Larche and Nachon, on the Esplanade des Invalides, is particularly interesting. These two architects have laid the realm of Flora under contribution for the decoration of their façades — a rich realm and an elegant, ransacked with artistic perception, and its spoils arranged with grace and fancy; all ending in lending a modern note to the architectural lines, themselves well composed. Here is really a step towards an interesting modern style.

The foreign architects are less fantastic, but the pavilions which they have built on the banks of the Seine are amongst the jewels of the Exposition, because of the picturesqueness of their silhouettes and the architectonic construction of the buildings themselves.

One of the buildings most remarked is the Belgian building, a reproduction of the Hôtel de Ville at Audenarde (1525-1530), dominated by a superb openwork belfry rising to a height of 40 metres, and crowned by a statue in red copper representing a warrior of the Middle Ages bearing the arms of the city on his banner. In the interior, a monumental staircase leads to the first story, where the principal room represents the grand hall of the Hôtel de Ville, with its lofty mantelpiece decorated with sculpture and Gothic statues. The walls are decorated with paintings representing the arms of the principal cities of Belgium and of the different trade-guilds. Magnificent and very ancient Flemish tapestries ornament the panels and aid in giving to this room a very interesting local coloring. On the same floor, a second room reproduces the sheriff's hall, and it also is decorated with ancient tapestries.

This entire series of palaces is very much like a retrospective exhibition of foreign architecture. Thus Germany initiates us into the

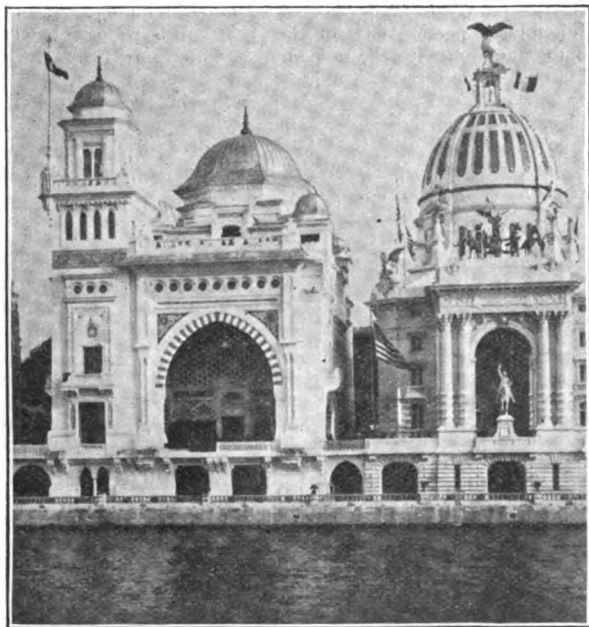
polychromy of her Renaissance façades of the sixteenth century: nothing is more curious than these grand allegorical paintings representing the four elements of nature in lively and crude colors. A picturesque belfry, scintillating with gilding and bearing a large clock and chimes, dominates the palace, the building being an artistic as well as a learned work. It is Herr Radke, architect, who has decorated all the works in the German section, much remarked for their richness and good taste. The interior of the German pavilion is not less interesting from the retrospective point-of-view. It contains a respectable number of paintings drawn from the collection at Potsdam and graciously loaned by Emperor William II himself. It is a treat indeed for intelligent visitors to see these marvellous specimens of French art. Here we find an incomparable series of Watteaus, Lancret's, Paters and Chardins, arranged with taste in a suite of charming rooms ornamented with French furniture in the style of Louis XV. In a room on the first story, amongst the collections of the Royal Printing-press, are to be remarked very interesting reproductions of the *chefs-d'œuvre* of Albert Dürer.

Several of the foreign buildings on the banks of the Seine contain very little in the way of exhibits. They are in some sort reception-rooms, national products being exhibited in the palaces of the Invalides or the Champ-de-Mars, in the sections corresponding to the different kinds of industry.

The United States pavilion, a very important one and in Classic style, contains no exhibits properly so-called, and it must be confessed that, for most, it seems a little empty when its size is considered. The entire interior, in fact, is consecrated to reading-rooms, reception-rooms and offices. The lower story consists of a vast hall, upon which open the circular balconies of the upper stories, and which is itself crowned by a great dome that dominates the exterior of the building. An American post-office occupies one portion of it. Upon the upper floors, served by elevators and four staircases, are arranged divers reception-rooms and those reserved for the Commissioners from the various States, the Members of the Jury, for the Loyal Legion and for the American Chamber of Commerce at Paris. It is, in a certain fashion, an American habitation, whose several parts are always open to American visitors, who there feel themselves thoroughly at home.

The façade is impressive because of its large dimensions. It is preceded by a monumental portico, a kind of grand triumphal arch, of the Corinthian order, supporting a superb quadriga representing "Labor, on the car of Progress." Under the arcade which faces the Seine is found an equestrian statue of Washington. On the lateral façades, which rule with the lines of the portico, are detached *avant-corps* crowned with pediments. Above soars a dome resting upon a series of elegant arcades, and upon its summit an enormous eagle spreads its golden wings. The entire structure is of wood and staff. The style is Classic, of good proportion, and carefully studied by the architects, Coolidge and Morin-Goustiaux; but the neighborhood of the palaces of Italy and Austria, both of them very picturesque and very rich in sculpture and decorations, makes its academic and somewhat severe air all the more pronounced. This imposing piece of architecture should have had a greater isolation to be appreciated at its real worth.

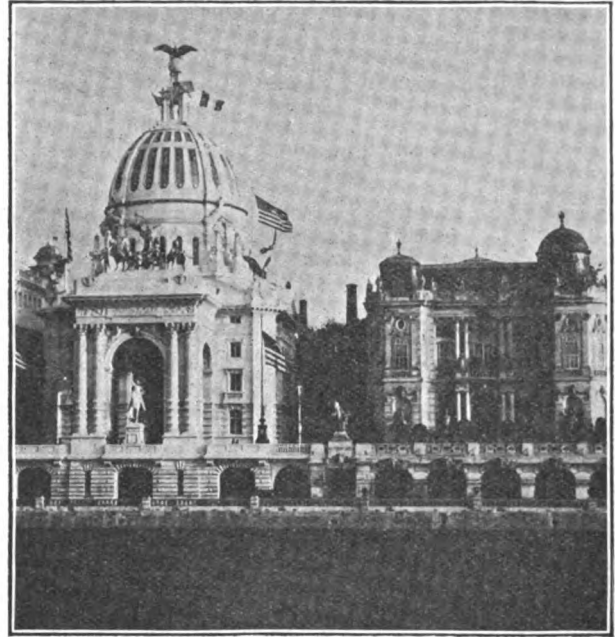
Now here I am at the end of my ordinary space, and what I said



Turkish Building. M. Dubuissou, Architect. United States Building. MM. Coolidge and Morin-Goustiaux, Architects.

at the start strikes me still more. How many things there are to see! And, in the impossibility of satisfying the curiosity, how many things must be sacrificed! Never mind; if the bill of fare of the banquet be too copious, all the dishes are savory. We will therefore

choose those which appear to us the finest and most artistically served. The success is already startling, and the enclosures of the Exposition are at all hours too narrow for the crowd which presses within them. During the fêtes of the Pentecost the number of



United States Building. — Austrian Building.

entries exceeded 500,000 a day.—In 1889 the highest figure was about 300,000.—What then is it likely to be in the months of August and September, in the full vacation time? It will be no longer possible to circulate, and the movable platform will be full to overflowing! That is a true success, that movable sidewalk, which on days of crowds presents the aspect of a human ribbon measuring six kilometres, 350 metres, in length — a very pretty girdle indeed!

ILLUSTRATIONS

[Contributors of drawings are requested to send also plans and a full and adequate description of the buildings, including a statement of cost.]

A COMPETITIVE DESIGN FOR THE NEW YORK STOCK EXCHANGE BUILDING. MR. R. H. ROBERTSON, ARCHITECT, NEW YORK, N. Y.

PLANS AND SECTIONS OF THE SAME BUILDING.

TWO DWELLING-HOUSES, BALTIMORE, MD. MR. LEANDER NEAL, ARCHITECT, BALTIMORE, MD.

THE dwelling shown with a tower front is situated upon Eutaw Place, near Druid Hill Park. The front is of red sandstone to second-story sills. Above that point the material is stone and Pompeian brick, a tile roof surmounting the whole. The finish of the rooms is of *prima vera*, or white mahogany. A wainscot 8' high is placed in the hall. In the parlor and music-room the wainscot is kept at 3' above the floor. Above and upon the ceilings is a fresco upon cloth. The design is somewhat Colonial. The dining-room is wainscoted; the ceiling has a beam finish, all of quartered oak. The remaining part of the plan explains itself. The second-floor rooms are well proportioned, each with a connecting toilet. The swell side to library adds very much to the effect of the room. The finish of entire floor is quartered oak. The third floor is similar to the second. The cost of dwelling was \$35,000.

The other dwelling is also situated upon Eutaw Place, near McMachen Street. The entire front is of brownstone. The vestibule is wainscoted in carved oak to the height of transom. The hall and stairway are also in quartered oak. The parlor and music-room are finished in cream and gold. The walls are panelled in plaster and silk. The dining-room is finished, panelled, etc., in mahogany. A breakfast-room is placed at the rear of this floor. Upon the second-floor front is placed the library, finished in hardwood, with panelled ceiling and walls. A feature in this room is mirrors placed in the wall panelling. Sliding-doors connect with the adjoining chamber, both rooms to be used upon festive occasions. A children's playroom or study is placed at the rear of the house. The third floor is similar to the second. The cost was about \$30,000.

APARTMENT-HOUSE. MESSRS. CRAM, GOODHUE & FERGUSON, ARCHITECTS, BOSTON, MASS.

[The following named illustration may be found by reference to our advertising pages.]

THE ITALIAN BUILDING: PARIS EXPOSITION OF 1900.

THE BELGIAN BUILDING: PARIS EXPOSITION OF 1900.

THESE plates are copied from *La Construction Moderne*.

[Additional Illustrations in the International Edition.]

HOUSE OF MR. F. L. V. HOPPIN, ARCHITECT, NO. 118 EAST 22D ST., NEW YORK, N. Y.

[Gelatine Print.]

MAIN ENTRANCE: JUDSON MEMORIAL CHURCH, WASHINGTON SQUARE, NEW YORK, N. Y. MESSRS. MCKIM, MEAD & WHITE, ARCHITECTS, NEW YORK, N. Y.

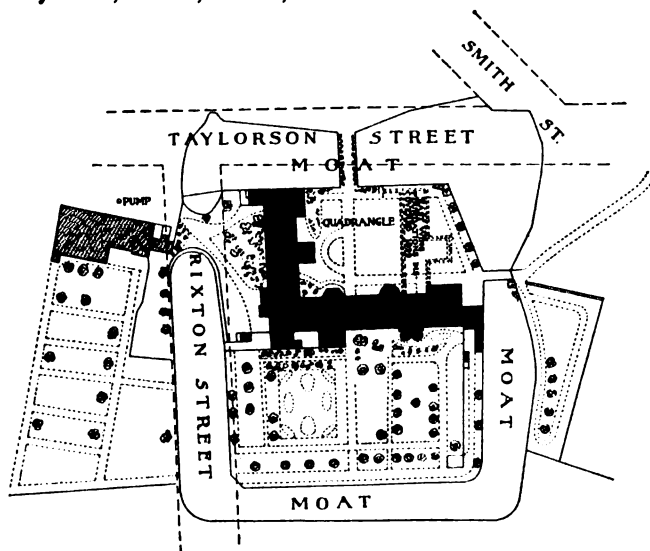
[Gelatine Print.]

CLERK'S OFFICE: COURT-HOUSE OF THE APPELLATE DIVISION, NEW YORK, N. Y. MR. JAMES BROWN LORD, ARCHITECT, NEW YORK, N. Y.

[Gelatine Print.]

RESTORATIONS¹ AT ORDSALL HALL, NEAR MANCHESTER, ENG.: FOUR PLATES.

ORDSALL HALL stands on the north bank of the River Irwell on the Salford side, and is about two miles southwest of the Cathedral Church of the city of Manchester. Ordsall is the ancient home of the Radcliffe family, but is now in the possession of Earle Egerton, of Tatton (Tatton Park, Cheshire). The Radcliffe family came into possession of Ordsall about the middle of the thirteenth century. Sir Richard served under Edward III in the French wars, and from their share in those wars was derived the family motto, "Caen, Crescie, Calais."



The Radcliffe family suffered much loss and persecution through their religious convictions, being staunch adherents of the Church of Rome.

Ordsall Hall, in its perfect state, consisted of a centre and two wings, forming three sides of a quadrangle, the whole surrounded by a moat. The house was approached by a bridge and porter's lodge, at the end of a fine avenue of sycamores. From Leland's description [who visited the locality in 1538], it would appear that Ordsall had at that time a fine park.

From observations made during the last four years of restoration, it is clear that Ordsall was built at three different periods. The eastern portion, now used as a rectory-house, was the first portion built of timber framework, the spaces being filled with coarse plaster containing straw and other "binding" material. This certainly is a piece of English domestic architecture of the early part of the fifteenth century. The portion which forms the western end of the great hall was next built, probably about the end of the fifteenth century.

The great hall, fitted in between these portions (a substitute for an earlier building), is of "Perpendicular" work of the time of Henry VII or VIII, and is the result of greater luxury in living consequent on the overthrow of the feudal system and the abolition of fortified architecture.

The brick, or western, wing marks the use of a new material, and

¹ The architect of the restoration is Alfred Darbyshire, F. S. A., F. R. I. B. A., of Manchester. He directed the alterations, decorations, etc., of the Lyceum Theatre, London, when Irving (now Sir Henry) took it, in 1878. He has directed several other important restorations besides Ordsall Hall. He designed and had charge of the reproduction in actual buildings, etc., called "Old Manchester and Salford," at Manchester, at the "Royal Jubilee Exhibition" in 1887. (Also several other similar works at Birmingham, Albert Hall, London, etc.) The restorations at Ordsall Hall are now (October '99) about completed.

was erected by Sir Alexander Radcliffe about the middle of the seventeenth century. This wing occupies the place of a former wing of timber framework, and was devoted to the use of the servants.

It has always been supposed that a similar timber-framed wing occupied the vacant, or eastern, side of the quadrangle and was devoted to the use of the family.

During the work of restoration, the whole of the foundations of this wing have been discovered, thus setting the original plan of Ordsall beyond all doubt.

On the site of this eastern wing, a church is now being erected; its architecture is in keeping with that of the old Hall, and its gables are timber-framed in the black-and-white style.

Ordsall is a typical example of the wooden halls of England, which were erected between the stone and brick building epochs. Its central hall is one of the finest in England. It has an open timber roof of great architectural beauty and a fine screen at the western end. This hall is 42'6" long by 25' wide. The hall at Cheetham Hospital, in the city of Manchester, is 43'6" long by 24'3" wide. Rufford Hall, in Lancashire, and Arlington Hall, in Cheshire, are respectively 46'6" and 45' long. Although not the largest, yet, for architectural beauty and proportion, Ordsall great hall surpasses any other example of the class. In old times a raised dais existed at the eastern end under a canopy. On this dais sat the lord and his family, whilst the rest of the inhabitants of the building sat in the body of the hall, "below the salt." The apartment was heated by an open brazier fixed in the middle of the floor. Over the polygonal window is a small gallery for minstrels, and this has been retained during the work of restoration and repair.

It may be noted that a most interesting discovery has been made by the architect entrusted with the restoration at Ordsall Hall. In the room over the "star chamber" were indications of a construction based on ecclesiastical lines. On penetrating into the roof, it was found that the ceiling below had been interposed in Jacobean times and a small Gothic open-timber roof of an oratory was revealed. It has long been known that in 1360 a license was granted to the then Radcliffe of Ordsall by the Bishop of Lichfield to have divine service solemnized by a fit priest, within his oratory or chapel for two years. This discovery was one of interest, and although the roof was much mutilated, the architect was able to make a drawing showing the original condition of the oratory.

Four years ago (1895) Ordsall Hall was in a sad state of dilapidation and decay, but instead of taking it down, Earl Egerton wisely determined to attempt its restoration and repair. The garden front was in the worst condition and had lost nearly all its original character. It was therefore determined to rebuild the entire elevation with such variations as nineteenth-century wants demanded. The fine "Perpendicular" hall has been carefully restored and repaired, and the oak quatrefoil ornament of the roof revealed. Where rotten timbers have been removed, they have been replaced by oak cut from Tatton Park [the Cheshire property of the Egerton family], and exactly on the old lines of the "Magpie" architecture.

The property is now devoted to Church of England uses. The grand hall is devoted to lectures, concerts, etc., in connection with the Conservative Workingmen's Club, which absorbs that portion of the best wing attached to, and approached from, the hall. The seventeenth-century wing is devoted to parochial purposes, and the "star chamber" portion east of the great hall is used as a clergy-house in connection with the new church, which now forms the eastern side of the quadrangle.

Over one of the Tudor-headed doorways in the great hall has been placed the following inscription:

"This ancient home of the Radcliffes, of Ordsall, was rescued from decay, and restored by Wilbraham, Earl Egerton, of Tatton, and Viscount Salford, 1897."

NOTES AND CLIPPINGS

COURSE IN SANITARY ENGINEERING AT YALE UNIVERSITY. — The governing board of the Sheffield Scientific School of Yale University, New Haven, Conn., announce the establishment of a new undergraduate course of instruction in sanitary engineering, to open in September, 1900. Students of the freshmen and junior classes are permitted to elect this course, which is based upon the course in civil engineering. The junior year work will be essentially the same as the course now given in civil engineering, but for the senior year a special course of instruction is arranged, which includes the study of physical geology, masonry and cements, hydraulics, mapping and calculations, surveying, water supply engineering, mechanics, sewer design, sewage disposal, bacteriology and chemistry. — *Metal Worker*.

RUSKIN IN FRENCH. — Ruskin's works are about to be published in their entirety in the French language. What will the French think of Ruskin as an art critic? The *London Globe* believes that thinkers in France cannot fail to find his influence a powerful one, and can hardly escape being affected by his sincerity and enthusiasm. This much may be easily admitted, but no doubt the French, like the rest of the world, will not accept Ruskin's judgment on works of art without a very large grain of salt.

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JULY 21, 1900.



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WE understood that a discussion of the methods followed in the architectural schools and by the editors of the various architectural journals was to be had at the recent convention of the Architectural League of America, and we have been hoping to find somewhere a full report of the views advanced during this discussion, as we have an interest in the second topic and believed it possible we might come upon some suggestions of value. But as we find no mention of the discussion, and so infer that it did not take place, we are moved to make the following remarks. Recalling how much more the generation we belong to knew about architecture twenty-five years ago than, by the confession of its individual members, it does now, and realizing that human nature does not change much from one generation to another, we believe we have a fair working knowledge of the attitude of the heights from which the young men of to-day launch their criticisms of the schools and the architectural press. The audacious assurance and self-complacency of youth is a glorious possession, and if we only knew how short a time it would last, our enjoyment of it would be still more intense, though perhaps our use, or abuse, of it would be still more profligate. But while of our generation it might be said, as of others, that it was "nothing if not critical," it can be said with equal truth of the present generation that it is "nothing but critical." Now, while criticism is one of the most useful of the tools of progress, hypercriticism is one that no good workman will use, and it is one of the misfortunes that the young so often mistake the tools they undertake to use. To allege that no school is good and all teachers are feeble-minded, or that no architectural journal is worth its subscription-price, is to assert an inanity, since the assertion is so easily controverted; yet this is just the kind of hypercritical or, rather, uncritical remark that can be heard in any gathering of young men to-day. The attitude is the outgrowth of the situation. Never has there been a time when so much was done for the rising generation as now, particularly for that part which is to practise architecture in the future. Whereas a generation ago there was only one architectural school, and that but just founded, now there are dozens; and the young man, seeing that he is so anxiously provided for, will have none of them — if the having must be accompanied by expressed approval. He appears to believe that he requires tuition vastly better than can be provided by his elders, tuition, in short, that can only be furnished by those of his own age — or by himself. So, too, with the American architectural publications, now so abundant, but once so rare, so rare that in lieu of them the young man of a generation ago anxiously "scrapped" all kinds of crude cuts he found in secular newspapers, catalogues and circulars, and kept his pencil busy tracing and sketching from the library of his employer. But the draughtsman of to-day daily

throws into the waste-basket circulars and catalogues filled with process-cuts of real architectural interest which he hardly deigns to look at, and as for spending money for books or architectural periodicals, that is apparently the last thing he thinks of. Why should he spend, when he disdains to use what would be bought? How can he be inventive, if he keep before him the precept and precedent that lie in the work of others? Later in life he will be ready to acknowledge that, after all, it is a pretty good world, that the architectural schools are really pretty good schools and the periodicals are not quite as bad as they might be. But just now he is anything but ready.

PROFESSIONAL journals are established for the benefit of the professions to which they severally devote themselves. Generally speaking, they are supported only by the members of those professions, and, as a rule, the best of them are loyally supported. Amongst the professional periodicals, those devoted to architecture hold a place by themselves, for not only are they agencies of professional instruction, and vehicles for good council and advice, just as legal, medical and religious journals are, but they afford a means of intercommunication between architects and the public, since in the last analysis the illustrations published accomplish two things; they afford instruction, foster emulation and give encouragement to professional readers, and, secondly, they serve to inform the public as to the artistic capacities of the architects whose designs are published. That is, they are excellent advertising mediums for the profession and all the more to be cherished and supported because the journals make no charge for the advertising afforded. In another particular the architectural periodicals hold a different place from that held by any other professional journal. No other professional men than architects, acting in unison and as a body, make deliberate attack upon the commercial prosperity of their professional journals. It is true that this has not always been the case: this attack by the whole body of the profession upon the architectural press is a new movement, unintended, doubtless, but none the less real and to be deplored and feared by those who have invested capital and spent years of anxious thought and conscientious labor in making the journals they conduct worthy exponents of professional thought and artistic performance. The attack is made by the rising generation in thoughtlessness, partly, and in part it is another symptom of the prevailing hypercriticism of the day. It is a sufficiently real injustice to induce us to describe it at length, and, in behalf of the entire professional press, draw public attention to the manner in which its vested interests are being brought in peril, how needlessly, and to how little gain to the profession. In all probability, it will do no good to speak, since the assault comes from what are really irresponsible sources, but sources, none the less, which receive the support of the body of the profession. The attack is that made by the exhibition catalogue. To most individuals, very likely to some other publishers, this will seem an extreme statement to make, but we believe we can make our allegation good.

THE income of a periodical comes from two sources only, from subscriptions and from advertisements. Now, it is a matter of observation on the part of publishers of architectural books as well as of publishers of the periodicals that sales and subscriptions, in late years, do not keep pace with the increase of architects and architectural draughtsmen in the country. In part, this is due to competition between the many publishers, but it is mainly due to the existence of the club library. There is no man so immovably fixed in his determination not to buy or subscribe as the one who can give as his reason the fact that he "sees the publication at his club." There is no cure for this. It is a reasonable position; but this fact shows that the existence of the clubs is not helpful to the periodicals, and it alone should make the clubs all the more hesitant to inflict another and less natural injury on the periodicals. The second source of income is the advertising field. Now, with most advertisers the amount of circulation counts for a great deal and it is impossible to make them believe that the single copy in the club library is as beneficial to them as a hundred copies would be in the hands of as many individual members.

Hence, the club library through affecting the extent of circulation affects also the income derivable from advertisers. This, too, is a natural and unavoidable injury done by the clubs to the periodicals. These natural injuries are inherent in the situation, and neither we nor any one else has any ground for complaint — even when the clubs expect to get their single subscriptions with the largest discount off. Within a few years, however, the club exhibition-catalogue has appeared, and each club attempts to make its catalogue larger and more costly than its previous one, or than any issued by its fellow-clubs. Sumptuous catalogues cost a good deal of money, the club's exchequer is too low to meet the cost, and the only recourse is to the advertising field, with the hope, not only of covering the cost of the catalogue, but also netting something over for general club expenses. Very natural, perfectly legitimate and quite business-like, but very unfortunate for the periodicals, which, with their regular circulations, are "legitimate advertising mediums," whose legitimate incomes are thus unfairly attacked by a certain portion of the very profession whose interests they aim to serve; and since the drawings exhibited at these club shows are contributed by the profession at large, and neither exhibition nor catalogue would be very interesting without the assistance of the profession at large, so does the profession at large join in making the attack on its own professional journals, and by depleting their advertising incomes prevent them from rendering as full a service as they might. Manufacturers do not spend indefinite sums of money, but confine their expenditures to fixed annual appropriations, and if they find they are blackmailed into advertising in club catalogues — we use the word advisedly, because a manufacturer has used it to us in speaking of these exhibition catalogues, and because a member of a club catalogue-committee used it to us in saying how much he disliked the work his office put on him — they naturally have less to spend on advertising in the periodicals, and the share of the annual appropriation that falls to each periodical grows smaller as the number of exhibition catalogues increases.

BESIDES this direct injury, the gradual cutting down of the advertising income, the catalogue has further a detrimental effect on the periodicals' subscription-lists. Every advertiser knows that catalogue sales amount to nothing, and they are shrewd enough to insist that they shall have something for their money, so the clubs promise the advertisers that they will send a copy to "each architect in the country," or to a stated number of them, and doubtless they do so. We, at least, in our individual capacities, usually get several copies of each — an indication that even this free circulation is a little forced. In this way, the profession, or, at least, the younger members of it, are provided, without personal cost, with a large amount of architectural illustrations, and the recipient, naturally asks himself why, when he gets such a mass of stuff for nothing, he should pay subscriptions to the established periodicals, and he usually decides that there is no reason. It is clear, then, that the catalogue is attacking the subscription income as well as the advertising income of the professional journals, and though we do not for a moment suppose the attack will stop, we would ask whether it is quite fair, and really worth while. Is the profession ready to have the periodicals, which exist because they have proved their worth and right to existence, replaced by the catalogues, which this year include text-matter — essays, disquisitions and other professional theorizings, prepared one year by one set of young men and next year by another set? Is the catalogue illustration just the kind of thing as to size and clearness of presentation that is most to be preferred?

WE believe the matter is worthy of serious consideration, else the situation, as it appears to us, would not have been developed here at such length. The profession and the advertising manufacturers are already called on to support architectural periodicals in numbers greatly disproportionate to the needs of the very small profession in this country, and the largest income any of them might be able to win in competition with its legitimate competitors would be none too great to enable its conductors to do for the profession what they have both the willingness and the intellectual and artistic capacity to do for it. But if the profession, by its own action, elects to deprive the periodicals of a portion of their legitimate incomes, it must expect some falling-off in the amount and value of the

matter which the periodicals are enabled to provide, and should be chary of finding fault with the character of the output, and as the illustrations published are a part of this output, it may be well to refer back to what we said a year ago of the manner in which drawings are locked up in these modern perambulating exhibitions and have, in a sense, become stale and not wholly desirable for illustration in the periodicals after the close of the last exhibition in the circuit.

A not unnatural mnemonic lapse led us last week in speaking of the new American Bridge Company to write the name of a former contributor to this journal in place of that of Mr. Charles M. Jarvis, of Berlin, Conn., who is one of the vice-presidents of the new corporation, and will be, as we said, in charge of the operating department. The Mr. Davis we accidentally mentioned, so far as we know, knows nothing about structural metal-work, whereas Mr. Jarvis's knowledge is comprehensive and practical.

ONE of the last appropriations made by Congress was one for \$6,000 to be spent in elaborating and perfecting a certain plan for the enlargement of the White House in Washington, which seemingly is being worked into shape in the Office of Public Buildings and Grounds under the charge of Colonel Bingham, U. S. A. The scheme now being developed is said to be the one conceived by Mrs. Harrison during her occupancy of the Presidential mansion, and developed with a good deal of elaboration by a young architect of her acquaintance, Mr. F. D. Owen. Whether Mr. Owen is now working on the drawing under Col. Bingham's oversight, we do not know, but the block-plan of the scheme as printed in the *Washington Star* is a less elaborate and more sensible one than we remember to have been the one made public during the Harrison administration. The present scheme has the good point of leaving the present White House unaltered, the needed additional accommodations being provided in the two wings, or rather two individual buildings set at right angles with, and somewhat to the rear of, the present building, the connection between them being through colonnades which fill the external angles between the old building and the new ones. These colonnades are repeated on the southern ends of the Official Wing and the Public Art Wing, and unite them with the long conservatory and palm-houses which close the quadrangle on the south. Enclosed by these four buildings is a small private garden, which, owing to the spaces between the new wings and the White House itself and the probable low height of the conservatory, promises to be sufficiently well lighted and aired. So far as the general scheme is concerned, it seems a fairly reasonable one, and has the merit of not injuring the architectural character of the home of our presidents.

SEVERAL young girls have this year taken advantage of the new regulation of the Paris School of Fine-Arts, admitting women on the same footing as men, and have passed the examination for admission. Of these, a few have entered the Department of Architecture, one of them passing with great distinction. As the traditions of the architectural *ateliers* are hardly yet sufficiently transformed to allow the admission of feminine students, it is to be presumed that the girls in this department will be obliged either to work alone, or in some special *atelier*. In either case they will lose the influence of the intimate association of students, under the lead of the "*anciens*," which is perhaps the most important element in the school training, and it remains to be seen whether their talent and perseverance will make up for the loss. It is at least conceivable that the freedom from *atelier* tradition and routine, at an age when young people are particularly disposed to pin their faith to formulas, may be advantageous in developing individuality in those girls who possess talent; and it will be interesting to watch the result. In an American school, it might be predicted that the girls, although industrious and faithful, would not, as a rule, succeed in the intense labor necessary to architectural design of real value; but, in Paris, the rewards offered for artistic merit are so great, the local atmosphere is so stimulating, and professional criticism is so catholic, as well as so just, that women, as well as men, are encouraged to do the best that they are capable of, and whether the best architectural work of women is equal to that of men is a point which may soon be decided.

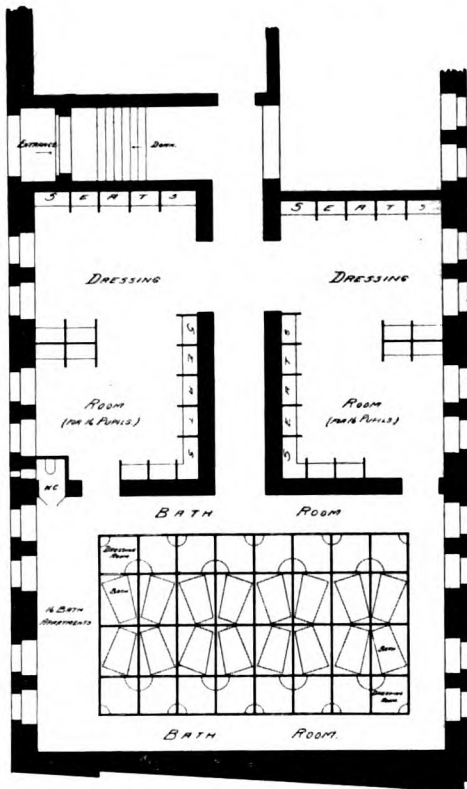
A PLEA FOR RAIN-BATHS IN THE PUBLIC SCHOOLS.¹—II.

Fig. 2. Spray-baths in Public School, Cologne, Germany.

hope, in the interest of the coming generation of our American school-children, that some pen, more facile and powerful than my own, will make a strong plea to our boards of education in favor of spray-baths in the public schools. I am convinced that this would incidentally help to solve, more than any elaborate mechanical arrangement, the question of school-room ventilation."

In the City of Boston, school-baths were introduced about 1896 at the suggestion of Dr. Edward M. Hartwell, at the new Paul Revere School, at the North End, designed by Messrs. Peabody & Stearns, architects, and soon after at another school in the West End. In the former school 1,000 children bathed in one week. When the baths were first contemplated, the Committee on Schoolhouses reported unfavorably, saying, "We hesitate to take the position that it is the duty of the school authorities to bathe the children in public schools because they may not be clean, for if this be granted, we see no reason why we should not clothe them if they be improperly clothed, or feed them if they are not properly nourished at home."

"But, outside of the legal questions involved, your Committee do not believe that it is in the interest of the public health to place these wash-houses in the basements of our public-school buildings, to there accumulate the uncleanness which may be brought in on the bodies of the children. More or less foul odors must necessarily come from this practice, and your Committee feel that the suggestion that eventually these wash-houses be used for the general public is not in the interest of proper sanitation."

It is to the credit of at least one member of the Committee that he replied to this as follows:—

"One would infer that the new Paul Revere School-house was not to be connected with the sewer at all. One would think that the accumulation of filth was to be kept there in the building. It is perfectly absurd to say that it is impossible in the basement of a public-school building, built as you have to build them in that section of the city, that a bath-house cannot be provided from which no odor whatever can arise. But, if we must have foul odors, let us have them in the basement and not in the schoolroom. It is not a wash-house at all, by the way, but simply bathing facilities in the basement of a school-building."

Later on, the Committee on Hygiene reported favorably, the vote standing eleven in favor of, and eight against, the sanitary measure. Mention was made at this meeting that though the Committee had spent about \$4,000 in one school to do away with unclean odors, they did not succeed in getting rid of them.

From the annual report of the School Committee of the City of Boston for the year 1899, I extract the following description of the school-baths at the Paul Revere School:—

"Not alone is the Paul Revere School notable for its attractive exterior and interior, its artistic decorations and the historic name it bears, but from the fact that it is the first school-house in Boston

to contain bathing facilities for pupils. This school is located in one of the most congested sections of the city, inhabited by a dense population, consisting mainly of Hebrews and Italians, with a liberal percentage of other nationalities.

"It was fitting, therefore, that in this crowded section should first be tried the experiment of school-baths. Two sets were installed in the new Paul Revere School, one for each sex, at opposite ends of the basement, which are open every school-day. On the girls' side there are ten individual compartments, each containing a seat and a spray. These compartments are of slate on three sides, with the entrance screened by a rubber curtain hung from rings which can be drawn at the pleasure of the occupant. There are also in the same room thirty dressing-closets, each containing a seat, hooks for clothing and provided with a self-closing blind door. The floor is of concrete, covered with movable slatted walks, made in short sections. The 'Gegenstrom' system is in use, whereby the temperature of the water may be accurately regulated, and a matron is in daily attendance.

"No individual accommodations are provided for the boys, the showers being grouped in a space about ten by fifteen, so that twelve pupils may bathe at the same time. The remainder of the room is used for dressing purposes, an oaken bench running along two sides of the walls, above which are hooks for clothing. This room is in charge of the janitor.

"Soap and towels are furnished without expense to the pupils. The arrangements for the use of these accommodations are such as to afford an opportunity to every pupil to bathe once a week throughout the school-year, but this is not compulsory. A certain time for bathing is assigned each class, when those pupils who so desire are given an opportunity to avail themselves of the facilities described.

"Pupils in the grammar as well as the primary school are admitted to these privileges with the exception of those who are too young to undress and dress themselves without considerable assistance.

"The providing of these accommodations is largely due to the effort of Mr. Lewis H. Dutton, the principal of the district, who earnestly advocated the proposition to place baths in this building from the time its erection was first contemplated. Between 125 and 150 pupils bathe daily, and the success of the experiment, as it was termed, seems assured. The estimated expense of conducting the baths, including the salary of the matron, soap, towels, laundry and heat, is about \$85 per month."

The author has been favored with a courteous letter dated March 17, 1900, from the Superintendent of Public Schools of the City of Boston, Mr. Edwin P. Seaver, from which the following paragraph is quoted:—

"The best response which I can make at the present time to your letter of the 16th inst. seems to be to send you a copy of the annual report of the school-committee of this city, recently issued, on pages 28, 29 and 30 of which you will find the subject of baths in the Paul Revere School reported. This is the only printed information I have within reach at present. Speaking generally, the results of these baths have been satisfactory. I think they would be more so if it were possible to put the children into clean clothes after the baths."

In New York City, the report of the Mayor's Committee on Public Baths, issued in April, 1897, after describing the German school-baths, urged their hygienic importance and stated that the cost of their introduction in the public schools would be inconsiderable. "The basements of our public schools, which are in many cases very little used, are peculiarly fitted for the establishment of spray-baths for school-children. Where now the basement is used as a playground, a roof-garden playground might be substituted and so a double advantage secured."

The Superintendent of Public Schools expressed himself in favor of the baths, but no further move was made in the matter until quite recently. I learn it is now the intention to introduce baths in some of the new school-buildings.

The general requirements of school-baths are as follows: They should be cheap in construction as well as in operation; they should be of such form and arrangement that the cleansing of the body may be accomplished in the least time, with the least quantity of hot water, and in a small space. Both the bath-room and the dressing-rooms must be well heated, free from dampness and from dangerous draft, and be thoroughly well ventilated and lighted. The apartments should be light, clean and sanitary throughout. The bathing

water should be of crystal-like clearness and purity. The children should be made to feel comfortable and safe, all danger of scalding should be excluded, all steam noises which are liable to frighten children should be avoided. Plenty of time should be afforded for undressing, washing and spraying, drying and dressing: for boys from twenty to twenty-five minutes, for girls about half an hour. As the

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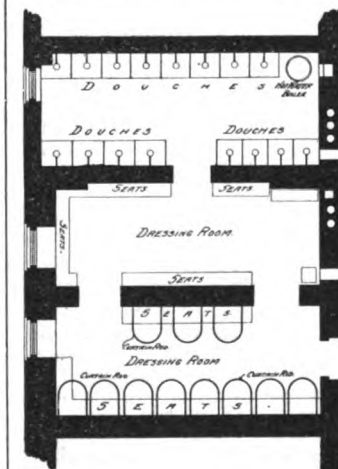


Fig. 3. Arrangement of Spray-baths, Public School, Munich.

¹A paper by Wm. Paul Gerhard, C. E., Consulting Engineer for Sanitary Works, read at the May 7, 1900, meeting of the American Social Science Association, held at Washington, D. C. Continued from No. 1281, page 13.

stream from a vertical douche upon the head is felt unpleasantly by many bathers, the douches should be set inclined. Participation in bathing must be entirely voluntary.

The zinc pans, originally used in the German school-baths, were soon done away with. It was found to be much better to arrange the entire floor of the bath-room with a pitch to a floor cesspool, or gutter with waste-pipe to the sewer. The placing of several children under one large douche is not as good as providing a separate douche for each bather; the distance between the douches should be from two-and-one-third to three feet, to give each child plenty of freedom in the movements of the arms.

In the plans of school-baths accompanying this paper, Figures 2 and 3 show examples of school-baths as arranged in school-houses at Cologne and Munich. It will be noticed that entirely separate bathing-cells are provided for each child in Cologne (Fig. 2), while in the Munich school (Fig. 3), the larger children have separate spaces, enclosed with curtains, for undressing. It would seem to me that baths like those shown in Figure 4, which illustrates the basement of a school in Wiesbaden, and like Figure 5, which shows a proposed school-bath for a large school, with separate bathing accommodations for boys and girls, designed by the writer, are far preferable. In both of these, the bath-room is entirely free and not divided into separate apartments. The plan of the Paul Revere School in Boston appears from the description to be a compromise between the two systems.

A general bath-room can be cleaned much better and quicker if the sub-divisions into compartments are omitted. I also hold that

the educational effect of having the children undress together in one large dressing-room should not be entirely lost sight of, for, as already intimated, this fosters habits of neatness as regards the under-garments. For the older girls it may be desirable, as has been done in the Boston school, to provide simple curtains for greater privacy in dressing and undressing.

Where in a co-educational school, separate bath-rooms cannot be provided for boys and girls, the bathing must be so arranged that the boys and girls bathe on alternate days.

It is usual to have the children bring with them their bathing towels, combs and brushes, but soap should be given by the school.

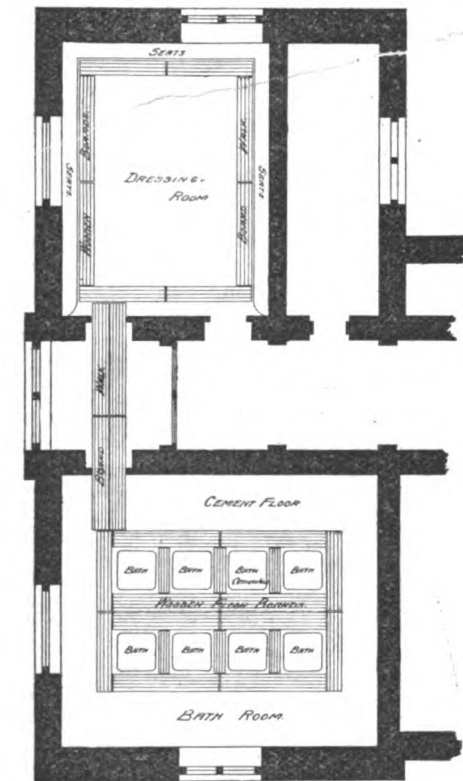


Fig. 4. Spray-baths in Blucher School, Wiesbaden, Germany.

The older children may be allowed to put on short bathing-tights or loin-aprons, though the necessity for using these hardly exists. It is desirable to arrange a suitable clothes-dryer for drying the towels used by the children. The bathing proper should not last more than five to ten minutes; the temperature of the water should be about 97 degrees to 98 degrees in winter and about 85 degrees in summer. It is well to provide a few douches for cold water, which, as already recommended, should be taken at the end of the bath as a protection from cold.

This paper does not intend discussing purely technical details, such as the means for heating the bath water and the mixing apparatus for the douches. I present, however, in Figure 6 an illustration which shows in vertical section the arrangement of a number of douches in school-baths, controlled and supplied from one mixing apparatus.

Passing on to the objections brought forth against school-baths, these may be said to come largely from men who are unfamiliar with their operation, and who have never witnessed the bathing of children under douches of tepid water, either in people's or in school baths. The objection arising from the fear that the basement of a school-house may become filthy is too absurd to deserve further notice. It is sometimes argued that bathing belongs to the home, and not the school, but what if the home is not provided with bathing facilities? And, again, where cleanliness is, perhaps, taught the pupils in school-courses on Physiology and Hygiene, is it not better

to go a step farther and let them learn, in a practical way, cleanliness and neatness in the school-bath?

Some raise the objection that it would be unwise to compel children to bathe, but experience teaches that, although bathing was nowhere made compulsory, the largest percentage of the children — 90 per cent and over — became eager to have a bath at least once a

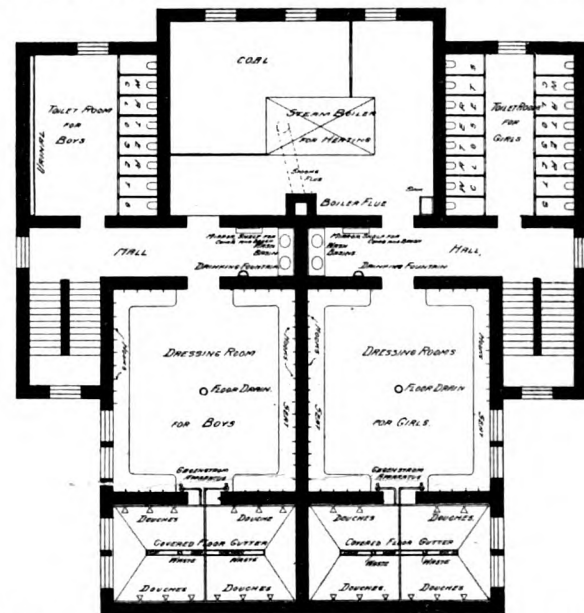


Fig. 5. Showing Spray-baths for Boys and Girls in Basement of large Public School.

week. Others fear the danger of exposing the children to colds, but if properly carried out, bathing in schools is less dangerous in that respect than bathing in the people's bath-houses, for here the children leave the building immediately after the bath, whereas in schools the bathing can be arranged in the middle of the morning or afternoon studies, and not during the last school-hour. Others, finally, argue in favor of establishing and maintaining free public baths, but consider school-baths unnecessary where the former are abundantly provided. Would it not be more sensible to arrange the school-baths so they could be used after school-hours by adults, like the public-baths, by simply providing separate outside bath-entrances in schools?

In all sections of this country, as in most other civilized and progressive countries, great attention is being paid to school sanitation. But, though much care is here devoted to lighting, ventilation and heating, to drainage and furniture in the school-room, comparatively little attention has hitherto been paid to the requirements of bodily cleanliness of the pupils. In the best modern school-houses, sanitarily planned, drained and ventilated, children are brought together who may, and often do, carry on their bodies and in their clothing the germs of infection. It was this very observation which compelled the hygienist, Prof. Fluegge, of Göttingen, after an examination of the healthful and clean school interiors of his city, to exclaim: "Of what good are all these modern sanitary arrangements, when dirty children, with disease germs lurking on their bodies or in their clothes, are brought into these healthful classrooms."

Now that the introduction of school-baths has been repeatedly

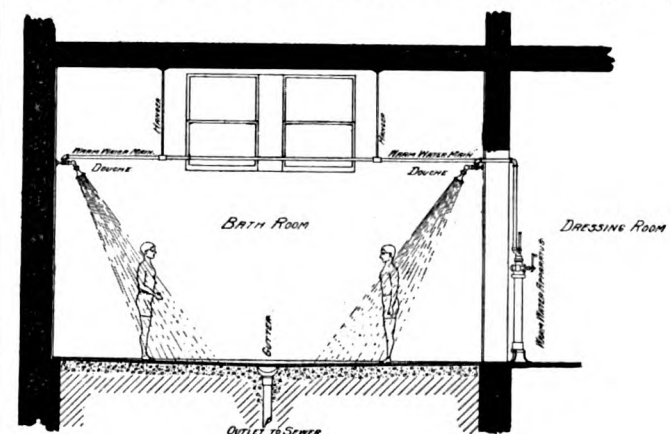
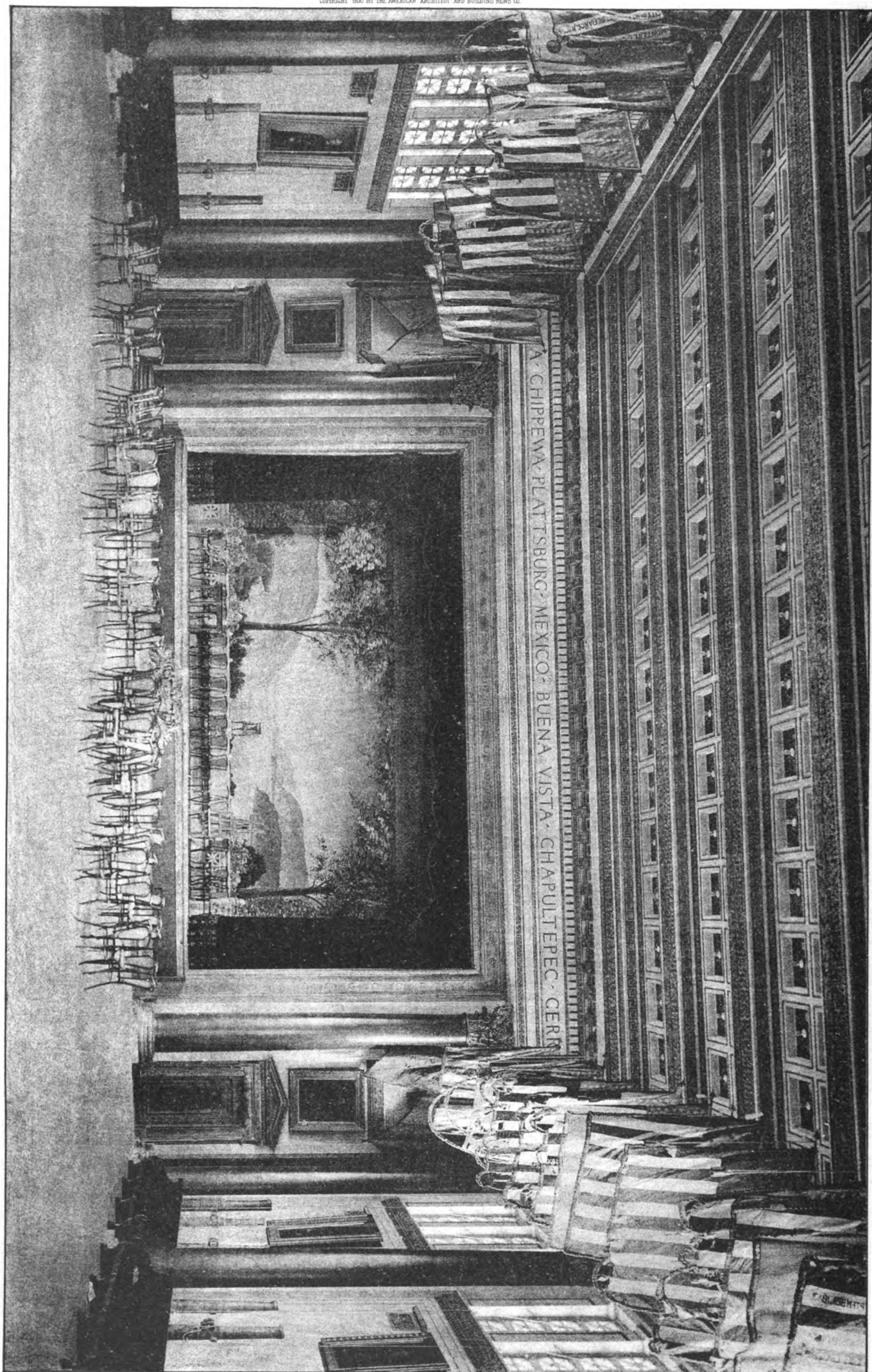


Fig. 6.

tried, so that it can no longer be called an experiment, we should not listen to voices which would deprive the children of an advantage the influence of which is sure to be far-reaching. All such attempts at blocking sanitary progress in school hygiene should be discountenanced.

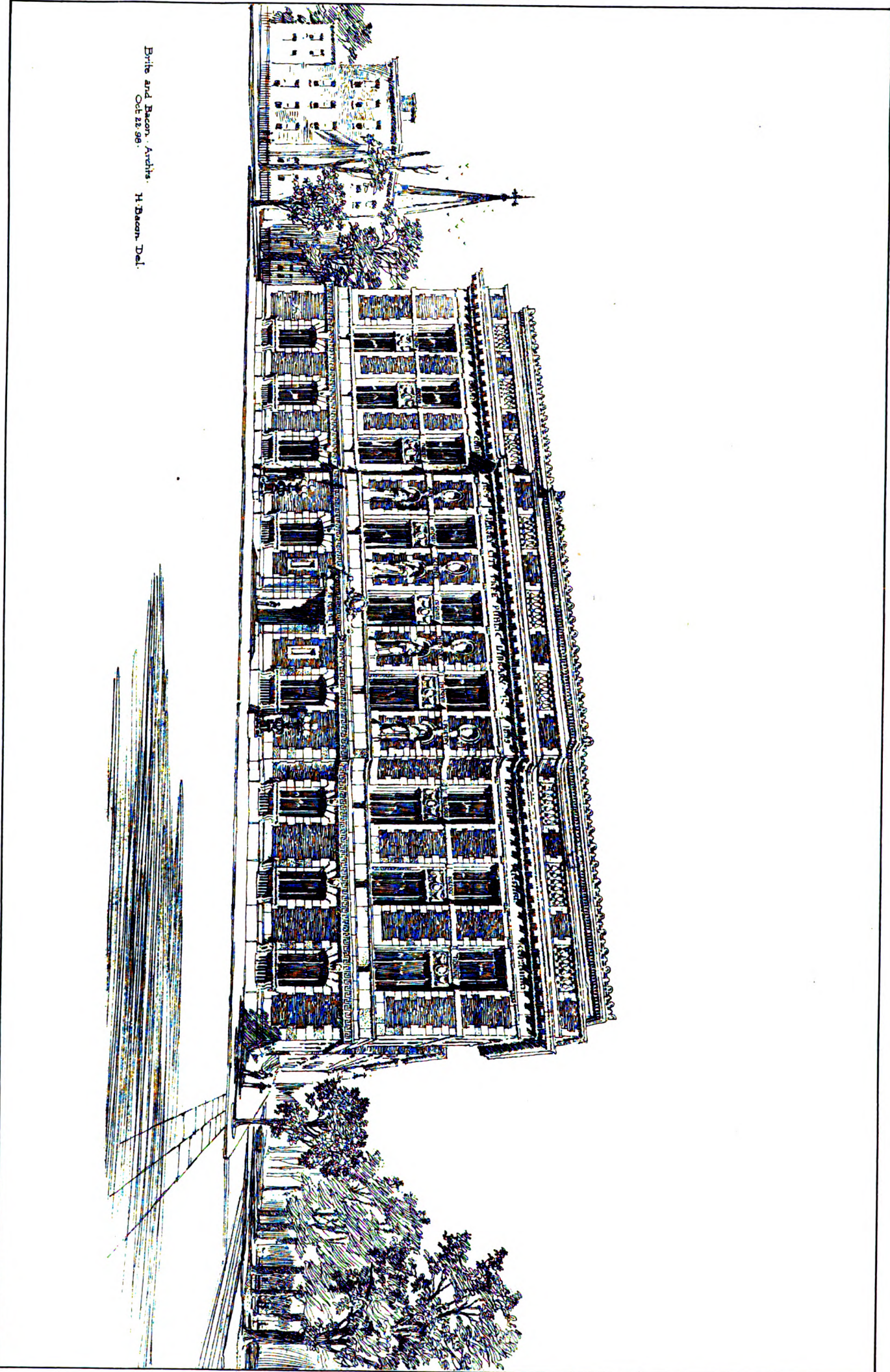
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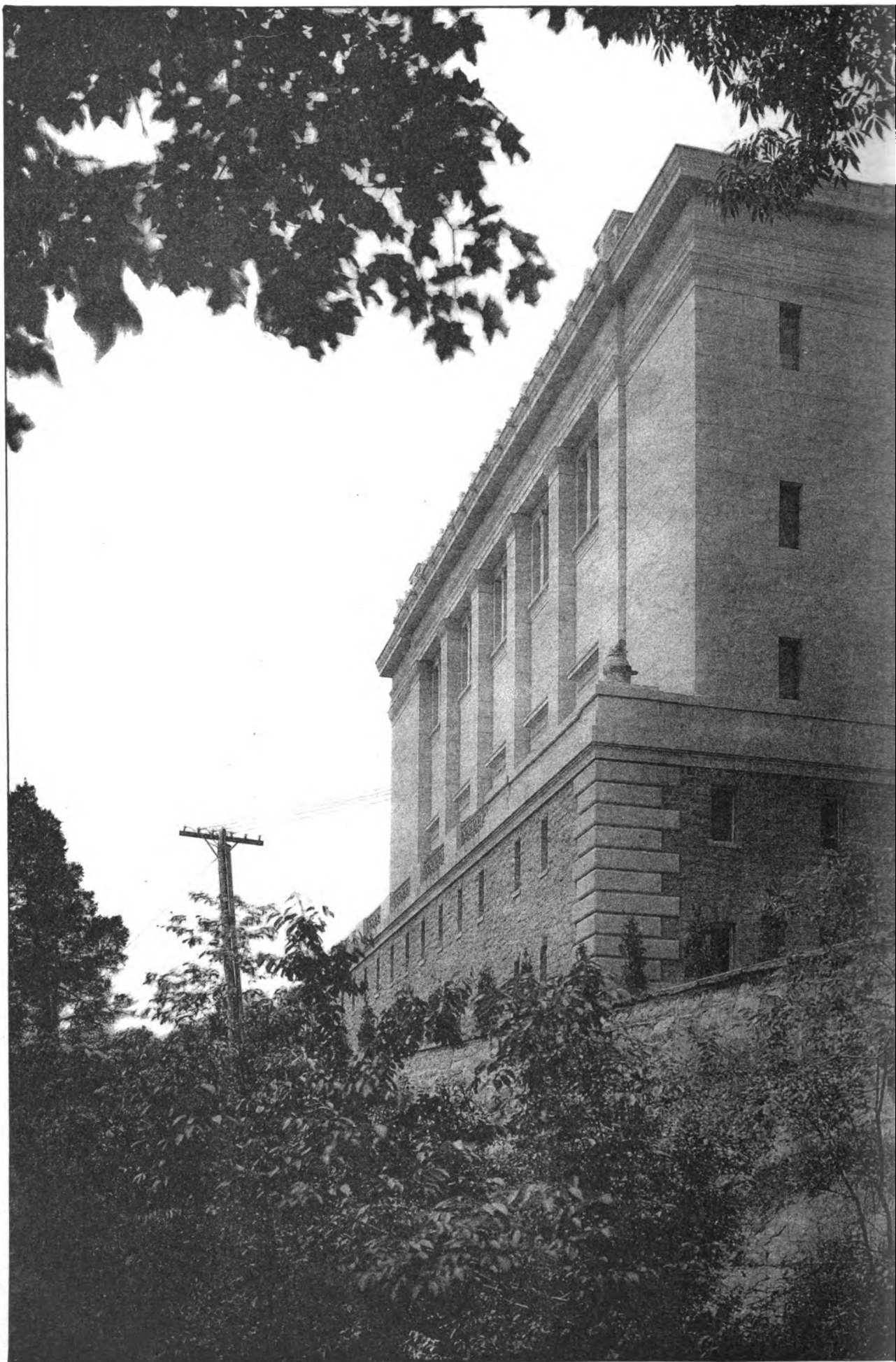
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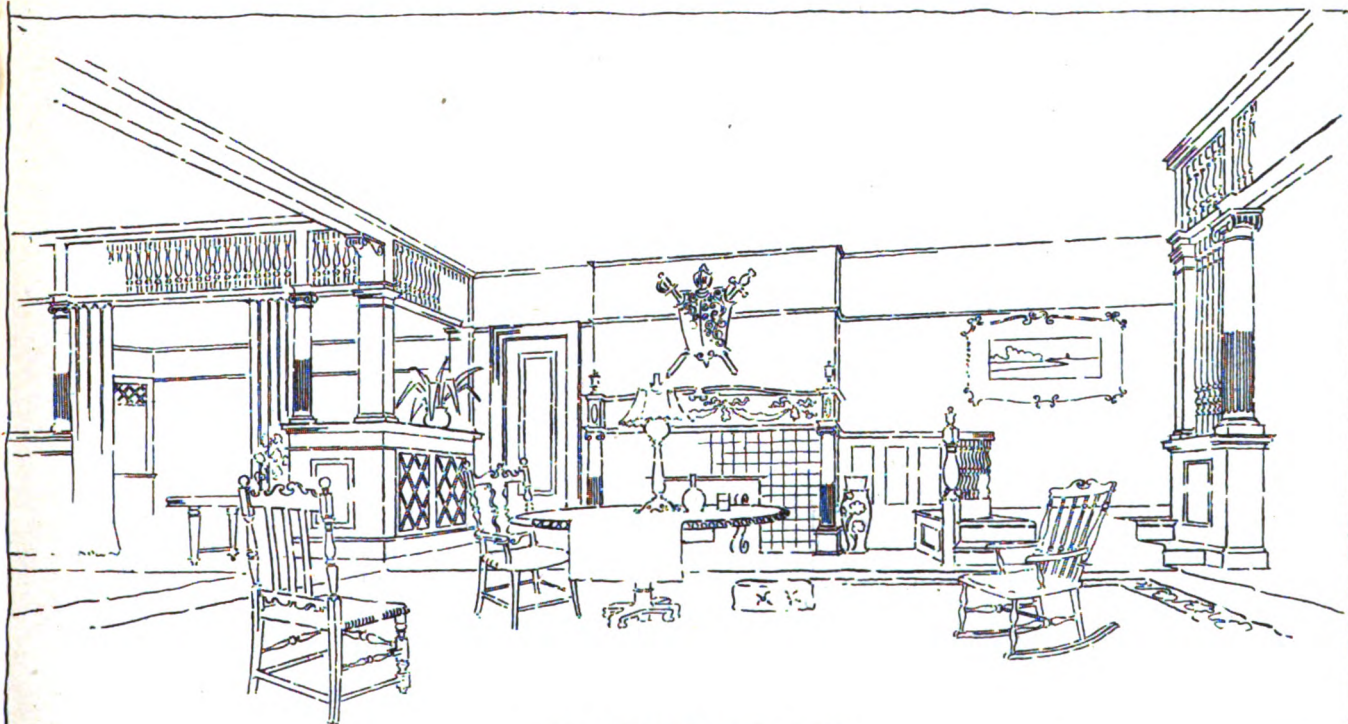
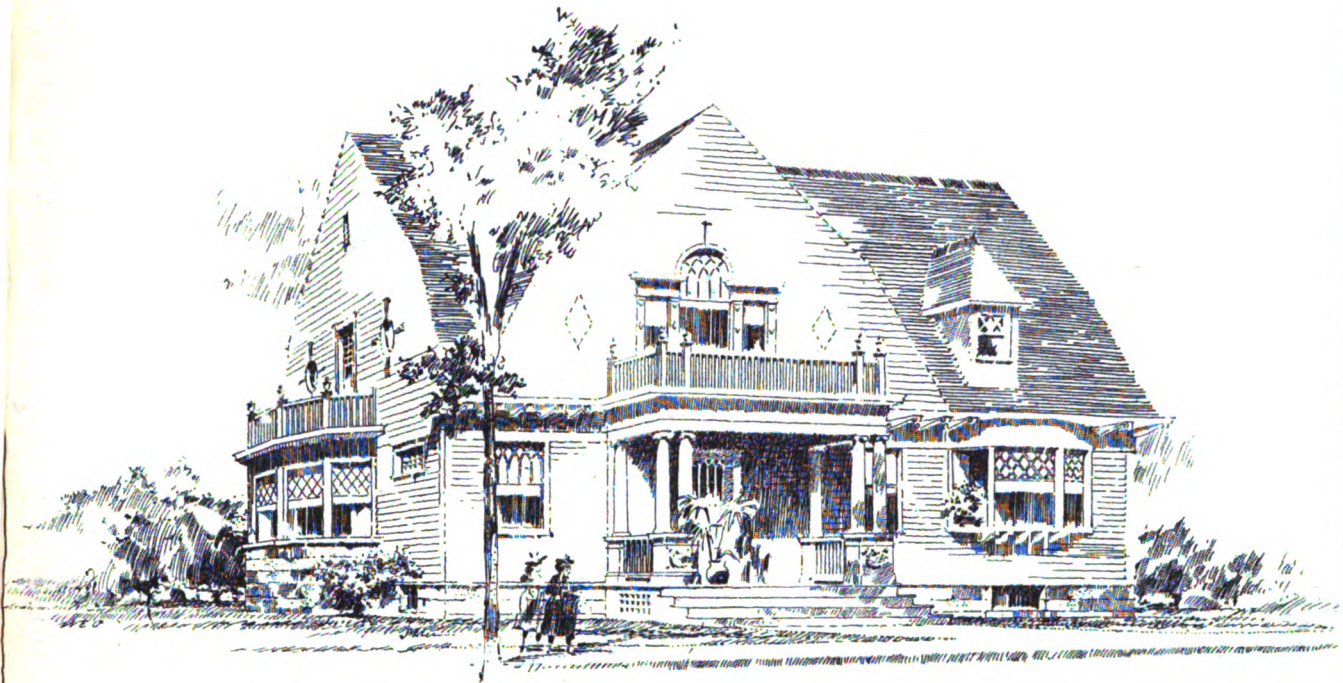
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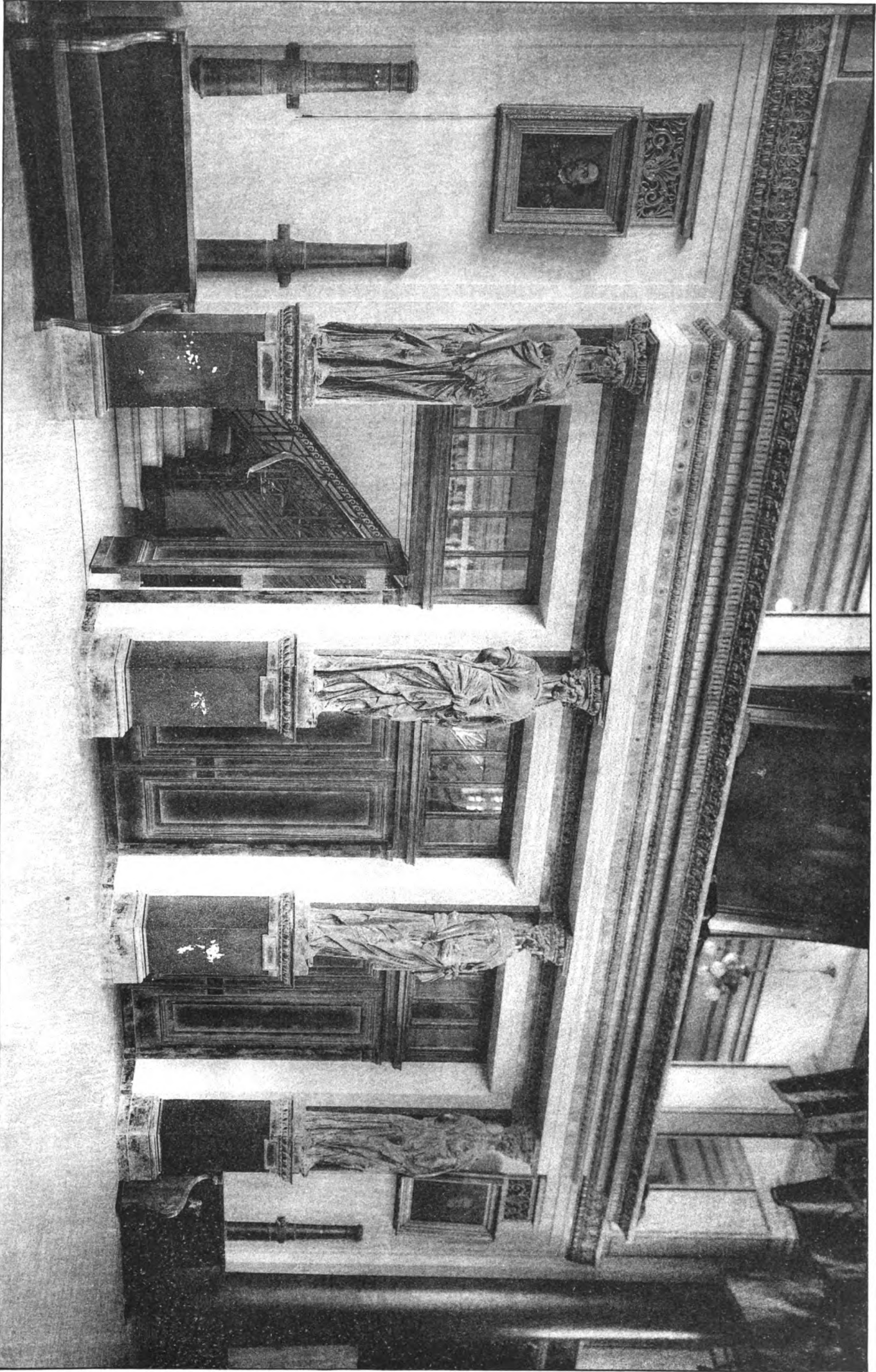


AL HALL, WEST POINT, N. Y.
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•VIEW •IN •STAIRCASE •HALL •
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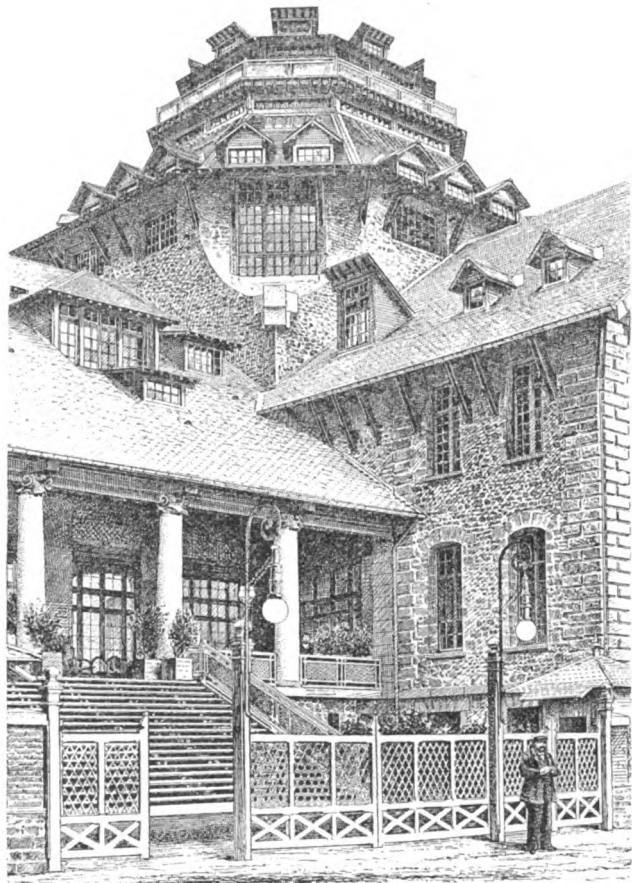
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Teachers are unanimous in asserting that school-baths are beneficial, that they foster bodily vigor, brighten the minds of the pupils, increase the interest in the studies, dispel laziness, improve the air of class-rooms, and increase neatness, cleanliness and decorousness, as well as the general health and happiness of pupils.

School-baths are, consequently, destined to become useful factors in the welfare of the present and coming generations. May the day not be far off when every American public school-house attended by the children of the poorer classes is fitted up with a sufficient number of spray-baths!

COLLABORATION OF ARCHITECT, PAINTER AND SCULPTOR.¹



Rotunda of The Casino, St. Malo, France. From *La Construction Moderne*.

A PAPER written to be read in ten minutes should, I think, be both terse and suggestive; it certainly cannot pretend to be exhaustive. Its object should be the promotion of intelligent, even warm, discussion. If this paper is abrupt in its transitions as well as in statement of my views, the foregoing reasons must be my excuse for such defects. We all desire closer union than now exists between the three great arts, as well as a more intimate conjunction with them of the lesser arts and crafts.

It is the wish of all of us that the spirit of the true artist should preside over all our labors, great or small — a spirit which induces spontaneity of design, and which prompts sincere endeavor to carry it out with clearness, which shall be the expression of ourselves, and, therefore, with style. Style is what is wanted, and is so often absent — the impression of the mind and hand of the artist. Of "styles" most of us weary; their use more often than not implies absence of invention, and is but an attempt to revitalize corpses. Rather than follow them ought we not to be bound by the requirements of our age?

The collaboration of the architect, sculptor and painter ought not to be difficult. To be successful the architect should not interfere with the sculptor or painter, *qua* their designs; this he will not need to do if his style is his own, for if they are true artists, all of them, they will give and take according to the requirements of their arts as well as for each other's art. They will each respect the other's province, that of the architect as the designer, or builder (as Wren is named upon his tomb), of the structure, of the sculptor as the designer and carver of effigies, ornament and its attendant parts, of the painter, the designer and executant of the pictures, their borders, etc., and their color-scheme.

But both sculptor and painter must give way to the architect upon matters of scale, of proportion of part to part, so that their work will be harmonious in scale with his; of quantity, of projection, whether in the round or relief, of the fairness or depth as to tone, of the painter's scheme. So will they labor in harmony.

¹ Paper, by Sir W. B. Richmond, read at the Congress of the Royal Institute of British Architects.

While architects insist upon "styles" they will get no first-rate sculptors or painters to aid them or to work with them. For the adornment of "styles" they have to continue to go to "firms" where they can be provided with as many shams as they require, all quite lifeless and hopelessly out of touch with the movement of this, or, for the matter of that, with any, period, because they do not reflect it.

As long as "styles" are abjectly adhered to, art must remain dead! No artists, as far as we know, imitated the work of their predecessors; they wrought in the vernacular of their environment. In recent times Viollet-le-Duc, admirable antiquarian and voluminous writer, has given an example of the inevitable failure which must attend upon "styles" of decoration in many of the churches of France. Witness his cartoons in the Louvre and his wall-paintings in Notre-Dame, about which nothing can be said but that they are wholly uninteresting.

Santa Maria Novella, in Florence, is a nest of anachronism, according to the modern standard. The wall-paintings there by Cimabue, Gaddi, Giotto and Ghirlandajo, and by later painters also, are side by side. Ghirlandajo did not paint in the style of Giotto; he painted as his period dictated. The west circular window contains glass of the early fourteenth century; the west window is late fifteenth in the style of the period. Side by side are monuments which date from the fourteenth to the seventeenth centuries in the style of the period. So the church, as it were, breathes history from its walls; its monuments and paintings are sincere demonstrations of their authors' originality and spontaneity. This is one instance out of hundreds which might be brought forward which proves the universal law that no art is really valuable which does not emanate from the spirit of the period which gave birth to its author. It is because of its sincerity of purpose that art interests us. Fancy Ghirlandajo decorating the portion of the church assigned to him after the manner of Giotto, or Giotto in that of Cimabue, because Cimabue painted on the walls of the church at the time of its erection; they would not, could not, have been such slaves to pedantry.

As soon as architects design original buildings — which, by the way, here and there they do, irrespective of severe canons of proportion and orders, but structurally consequent and individual — they will find plenty of sculptors and painters to work with them; but as long as they design in styles, no original men will be slaves to them; they must continue to get the adornments for their structures from "the trade." Is not it a mistake to specialize early? The young painters — indeed, the old ones also — know nothing or little about architecture; nor is the young sculptor made aware of the position that his work ought to hold in relation to spaces. Neither does the architect get a chance of working in conjunction with sculptors and painters, who should be his colleagues in his earliest days of training; they are brought up separately and they remain separate; consequently neither their interests nor sympathies are concurrent.

Finally, of course, the architect is the responsible person; therefore he should be a thoroughly-equipped artist. Would it not be possible to avoid too early specializing? How few architects there are who know anything about color! How few painters are even indirectly interested in architecture, and how few sculptors learn to be attendants upon architecture! And what a loss it is to each that he is so ignorant of his sister arts!

The great men of past times were rarely specialists. Every one knows that Giotto was painter, sculptor and architect. So was Raphael, so was Brunelleschi, so were Michel Angelo and Leonardo. Phidias was the son of a painter, and was educated in that craft; Ictinus was a sculptor as well as an architect. I suspect they worked harmoniously, and no doubt whoever designed the color-scheme of the Parthenon did so in conjunction with his colleagues.

The well-equipped designer is able to cover a large field of action. If he can design in one material, why not in another? None of the techniques are so enormously difficult, either of building, carving or painting, that they cannot be acquired by patience, given the artistic temperament. It is the artistic use of techniques acquired by experience which succeeds, or the reverse, in exact relation to the quantity of intelligence and judgment that has been put into it.

Our age is one of "harking back" — archaeological more than creative. Certainly this applies to architecture. But in the arts of painting and sculpture such a term applies with far less accuracy. The best work being now done in them reflects the spirit of our time. Do the majority of our buildings do that? Does the Tower Bridge reflect our time, for example? When architects do so, the sculptors and painters will almost automatically come into touch with them, and the crafts also with them.

To reiterate: no original designer, painter or sculptor would execute in the thirteenth, fourteenth, fifteenth or sixteenth century style to satisfy the pedantry of an architect, though if he had made an excursus into any of those styles he might be able to do so; but if he did, his work *qua* art and style would be quite valueless. The sculptor makes statues, the painter makes pictures; they do not design them only. Should not the architect make buildings? And just as the painter and sculptor learn anatomy, should not the young architect be apprenticed to a builder, that he may learn the anatomy of his art and become in the highest sense a builder?

I confess to thinking that art education cannot be commenced too early or be too broad and inclusive. Specialism would follow according to the bent of the student's capacity.

Should not a young architect practise decorative painting and sculpture up to a certain point? It could do him nothing but good. And the same principle should, I think, apply to the education of sculptors and painters; early instruction concerning plan and structure could do them nothing but good.

Advanced students should, I think, be encouraged to collaborate. Given a model designed in conclave, made by the architect, to be sculptured by the sculptor and decorated by the painter, how interesting such efforts would become! What a stimulus they would give to the three arts! Each student having thus become conversant with the arts of his colleagues would be in a position to criticise as well as to appreciate them.

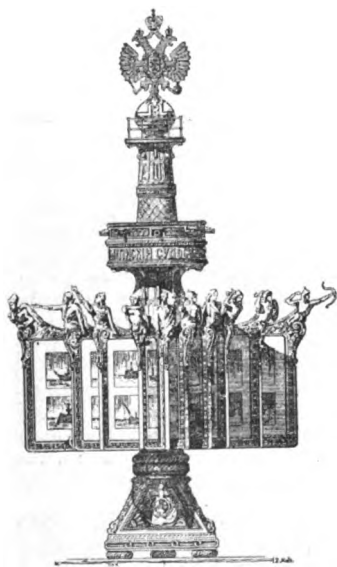
The three arts would thus grow up, as it were, together; they would not be strangers to one another. The great mother of the arts, architecture, would take to her children again, who have separated from her, as she has from them, to their and to her privation.

The purist may imagine that Greek temples, Early and Late Gothic Churches, or even Early Renaissance, were bald and colorless; but they were not. We know, on the contrary, that they were highly colored and decorated, probably with what we, with love of faint anæmic tints, would call crude colors. And modern buildings may be decorated with strong colors. Why not? Crude color soon tones down if the shades are harmonious.

Purity does not reside only in form; form is not its only exponent. Color can be rich, splendid, strong and yet be chaste. Chastity is not weak and anæmic, it is the sign of vigor and strength. Sculpture may be colored even vehemently; painted woodwork, marbles, gold and other metals can be introduced lavishly without one jot of purity being injured. But such a revival cannot come all of a sudden; we have to become used to experiments: these may be uncommon, unconventional, and as such they must take time to become established in and recognized by the public mind.

We have the material, minds and matter for the most rich and splendid work, but upon account of the divorce of the three great arts and of the crafts from them more or less that material is only serviceable within a narrow range and under unduly restricted conditions. Once get young students, architects, sculptors and painters into touch with one another's art, and a really vital school will spring up with astonishing quickness. Architects will then take their proper position as artists and sculptors and painters with them in conjunction. Pedantry and its near relative, dullness, will cease to exist; painting will no longer be considered as "The Art," and the other two as minors. To the attainment of this end we should, I think, struggle; an end which means union, wherein there is strength; share in the struggle and help, not hinder, each other's efforts. It is not precedence that any of us desire, but concord, mutual progress and unity. We are individually striving to render England more beautiful; let us try to do so collectively; let us strike out for freedom, not license, but freedom based upon the only sound formation, sincerity, combined with knowledge of the various branches of what after all is but one art.

LORD ROTHSCHILD'S BEQUEST TO THE BRITISH MUSEUM.



Picture Show-case for the Russian Navy Department. From *Stroitel*.

"THE Waddesdon Bequest" is at last on view at the British Museum, and a most splendid gift it is that we owe to the generosity of Baron Ferdinand de Rothschild. It is not a large collection numerically, but it is a very choice one, owing to the delightful capacity of the Baron's purse for stretching to any price demanded. For years agents were on the look-out, and practically they had *carte blanche*, to purchase anything which was first-rate of its kind. Thus the collection possesses some of the most beautiful specimens of Renaissance enamels, silversmithing, wood-carving, glass and jewelry which can be seen outside the Louvre or the Dresden Green Vaults. The Classical period is represented by four examples only, of which the two beautiful little bronze heads on the handles of litters are unique.

Among the cups and vases in rock-crystal and other hard stones, the mottled agate vase must be cited, the body of which is ancient Roman cameo-work, while the mounts are Italian Renaissance.

The Lyte jewel is a superb specimen of seventeenth-century goldsmith's work, possibly by George Heriot, or the painter of the miniature, Hilliard, who was also a goldsmith. The portrait of King James is a good example of the painter's work. His Majesty, we are told, was so enraptured with the pedigree that Mr. Lyte produced

for him, that he gave him this "picture in gold set with diamonds, with gracious thanks." This miniature was eventually sold by the descendants of Lyte to the Duke of Hamilton, and being included in the Hamilton-collection sale, was purchased by Baron de Rothschild for £2,835. Among the enamels are specimens of Jean de Court, Suzanne Court, Jean Courtois, the Pénicaud family, M. Courtois and Jean Limousin. Some microscopic wood-carvings are extraordinary: two in boxwood, about three square inches in size, contain the most elaborate representations of the Last Supper, the Crucifixion and the Resurrection, and have multitudes of figures whose limbs are perfectly formed, although they are no larger than a common pin. They are Flemish [1511-42].

A very rare specimen is a mosque lamp of the fourteenth century. Another glass cup of Eastern origin is interesting as being in form similar to the earliest shapes which were made in Venice. The ornament is quite Oriental in character; the figures strike one as being of the Hindoo type.

A grand damascened shield, made in 1554, came from the Demidov collection.

Some of the drinking-cups of silver parcel-gilt are quaint in design — representing animals, huntsmen, birds, etc. Most of the cups and goblets are of German origin. So is an ebony casket said to have belonged to Henri IV of France. It is ornamented with silver-embossed panels, engraved, one of which is very similar to the "Diane de Poitiers" by Jean Goujon.

The sketches and studies of Rosa Bonheur, sold shortly after in Paris, have been on view for a month in London. Anything more fascinating than some of these beasties, great and small, cannot be imagined, especially the pencil-studies of lionesses and horses; but my heart goes out mostly to one of the dearest, meekest, cleverest looking donkeys in water-colors one has ever beheld.

There are some equally fascinating Dutch people at the Dowdewell gallery — strange men and boys in baggy legs, and little girls with long frocks and close caps; quite fit companions for Rosa Bonheur's gray donkey. Imagine a *mayonnaise* of Holbein, Mortimer Mompes and a real Jap painter, and you may arrive at something approaching Mynheer Nico Jungmann's quaint drawings and brilliant colorings. Of course the artist's "originality" is somewhat forced, may be affected — it is surely impossible that even the inhabitants of Dutchland can really look like the "Marken Baby" and the "Little Girl lecturing her Doll." But for all that, these drawings are delightful, and the "Return of the Pilgrims from Kevelaar" is not only a most clever rendering of evening light, but a charming study of color. They march, these men and women holding Chinese lanterns, over a wooden bridge *à la Japonais*. The church and houses are lighted up; the sky is starlit. One thing only is perplexing. Whence comes the light upon the faces of the people in the foreground? Possibly from a lighted house behind the spectator; but there is no evidence thereof.

From Mynheer Nico to Turner is a jump backwards or forwards, according to the point-of-view — but certainly an abyss divides the two painters. At the Fine-Art Society, however, visitors are able to study the beautiful collection of water-colors belonging to the late Mr. Ruskin. All are interesting, some priceless; but not the least charming are two or three very rapid sketches of fish in body-color on gray paper. No more agreeable study could be made by a real student of art than by giving a couple of hours' work to these two galleries. No one for a moment would place the Dutch artist on a level with Turner; but the equal truth to nature in both painters' work is proof positive of the versatility of art and the diversity of minds and eyesight.

Some letters of Turner's in a glass case are interesting reading, especially one to a fond parent who had asked the painter's advice as to a school for his highly gifted, artistic son. Turner asks him if he be prepared to supply the boy with the means of living which it "behoves" him to do, as art requires more perseverance, assiduity and time than most professions, even if successful. Evidently Turner's opinion of art as a calling was that its pursuit did not always meet with any very great success.

S. BEALE.

BOOKS AND PAPERS.

AS a writer, M. Jules Breton is not entirely unknown to the public outside France; but as a distinguished painter, he is the friend of us all. Who that has seen his "Bénédiction des blés," at the Luxembourg, has not followed him year by year at the *Salons*? And it is just because he has been before us so long as an exhibitor, that he is not only a safe guide in criticising the painters of the century, but a pleasant companion while relating divers anecdotes of his friends.

The book commences with reminiscences of the *atelier* Drolling in 1847, when the author began his career as a student, and with criticisms upon the work of David, Delacroix and Ingres. There is no doubt there can be two opinions as to the merits of Delacroix as a colorist and of Ingres as a draughtsman (witness the series of pencil-portraits in the Louvre); but as to the honest convictions

"Nos peintres du Siècle." Par Jules Breton, de l'Académie des Beaux-Arts. 3 50 fr. Société d'édition artistique, Paris, 32 rue Louis-le-Grand.

of David many opinions may be held, for with him, politics and the safety of his own person seem to have had very intimate connection, and were more his guiding-stars than the pure love of art.

But it is when reviewing and criticising the artists of our own time that M. Breton becomes especially interesting, in pointing out, for example, that the early Barbazon painters made no pretension to any new discoveries, but based their work upon that of their fore-runners. "The masters of Corot were Poussin and Claude Lorrain," whom he studied when he could escape from the shop where he was condemned by his father to pass his days. He was, however, a good son, and it was some years before he rebelled and devoted himself entirely to art. He escaped at times and rushed to the Louvre to study his favorite painters; but his real master was Nature, which he observed from morning to night, "*courtisant la belle dame*" in all the mystic glory of dawn and twilight. Napoleon III used to say he could not judge of the truth of the painter's effects, as he was not in the habit of rising so early in the morning. When in Italy, Corot revelled in the beauty of the Campagna and the Lake of Nemi which bathed in malarial mists; and on his return to Paris he chose Ville d'Avray as a home mainly for its pond and its nearness to the Seine. At Neuilly there is still (or was two or three years ago) a little temple upon the island that figured in many of Corot's pictures.

Nor was Rousseau an innovator, for the Dutch School, and especially Hobbema, afforded the models upon which he built his exquisite art.

Horace Vernet, whose enormous canvases decorate the palace of Versailles, was one of the favored of this world. He was the friend of royalties, and in order to paint battle-scenes he got himself up as a *chasseur d'Afrique* and accompanied the troops. He was the most popular of painters, having a studio in the palace, where he worked midst the din of music and fencing without being disturbed. When his huge "*Prise de la Smalah*" appeared at the *Salon* (then held in the Louvre) a critic wrote: "*Les Noces de Cana de Paul Véronèse doivent étouffer sous ce pâle linceul.*" M. Breton "trembled with respect" when the great man corrected his drawing at the Beaux-Arts—he was so much upset that he only half took in what the master said! But Vernet's advice, in spite of his conceit, was worth attention. When a model was sitting on a pile of boxes, the professor found fault with the student's work because he had slurred over the painting of the boxes: "You should learn how to do everything." And yet M. Breton speaks of this attention to insignificant detail as showing the "vulgarity" of the painter. Why should the "glossy coat of a horse," and the "foreshortening of a rifle" be beneath the attention of a painter? Doubtless there is much that is false in the war-pictures of Vernet, and he has been put into the shade by our later painters, M. Detaille and the incomparable De Neuville; but rather for the artificiality of his methods and composition than for his truth to detail. The older painter saw war from the staff-officer's point-of-view, the modern men (including Verestchagin) from the soldier's.

M. Breton's estimate of Couture is much nearer the mark than the latter's great reputation of some years ago warranted. His enormous "*Décadence Romaine*" is artificial, not wholly well drawn, and poor in color. How did he attain his position in the world of art? Possibly, our author hints, because he was successful in impressing upon the public his high estimation of himself. "This is the secret of many a reputation which falls with the worker. *Celui qui doute de soi fait aussi passer le doute chez les autres.*" How different was Flandrin as a man and a painter! Will not his refined, sympathetic work live for all time?

What a certain instructor of youth translated "sketching in plain air" is passed in review by our author in his account of Courbet's career. This painter may be called the first impressionist; but he damaged his talent, which was great, by his insufferable self conceit. His work is daring, and frequently interesting in color and effect; but his air of patronage in speaking of other artists made him the laughing-stock of all but his own little circle of admirers, who were ready to praise an ill-drawn nudity as "worthy to be placed by the side of Titian!" "*Eh bien! c'est ça qui l'aurait embêté vot' Titien!*" replied the painter, with his Franche-Comté accent. Courbet's vanity went the length of thinking his friends in the right when they suggested that the men of the future would substitute his effigy for that of Napoleon on the summit of the Vendôme column—that column which he destroyed during the Commune! And yet some of his work is anything but contemptible; and, possibly, had his vanity allowed him, he might have given the world many pictures as fine as his "*Wave*," and now superior to the much-lauded "*Enterrement à Ornans*." Who now studies the work of this man, who said of himself, "*Je peins le mieux de tout Paris!*"

Of Paul Baudry, "*Paoliccio mio*," as Edmond About called him in the dedication to one of his books, M. Breton speaks as one would expect, most sympathetically; and he points out that had the great painter allowed some lesser artists to do the mechanical part of the Grand-Opéra decorations, he might have been spared for greater work. But Baudry was determined to paint every square foot himself, and so Charles Garnier's meretricious masterpiece undermined the artist's health and eventually killed him.

The question of posterity reversing the estimation in which Meissonier has been held by our generation is discussed by M. Breton. Certainly, his marvellous draughtsmanship is not equalled by his colorations, which are crude, and his painting is always more or less hard and unsatisfactory; but the wonderful movement in some of

his pictures, and his business talents and personal vanity will probably keep up his prices among millionaires for some time to come.

The self-named impressionists are passed in review by M. Breton, and those two great artists, Bastien-Lepage and Puvis de Chavannes, meet with just eulogy as well as with well-studied criticism from his pen, the latter being the text for a chapter upon modern decorative art. Probably, we are still too much under the influence of Puvis de Chavannes to place him in his proper niche of glory; but a stroll round the Panthéon ought to convert even the sentimental public which rejoices in poor Doré's monstrosities and other clap-trap of feeble religious painters. De Chavannes knew well that Nature cannot be copied in all her fulness; but surely he, as regards decorative painting, was one of the few artists who distinctly understood the adaptation of Nature to the requirements of art, and especially art in its broadest sense. With this great artist, painting, and especially decorative painting, was but one of the arts; for he treated the subjects of his frescos in relation to the buildings they were designed to decorate. With him painting and architecture were sisters who should be sympathetic, each working on her own lines, neither despising nor depreciating the other. He worked in the spirit of the great Cinque-Centists, but was, nevertheless, all himself, and possibly among moderns he was the one painter who was content to sit side by side with the architect, developing his ideas and beautifying his walls. Certainly, there can be little doubt in any mind that the walls of the Panthéon upon which Puvis de Chavannes worked are the most successful in the building.



[Contributors of drawings are requested to send also plans and a full and adequate description of the buildings, including a statement of cost.]

REAR VIEW OF MEMORIAL HALL, WEST POINT, N. Y. MESSRS. MCKIM, MEAD & WHITE, ARCHITECTS, NEW YORK, N. Y.

CULLUM MEMORIAL HALL, WEST POINT, N. Y.

ENTRANCE-DOORWAYS: CULLUM MEMORIAL HALL, WEST POINT, N. Y.

PUBLIC LIBRARY, JERSEY CITY, N. J. MESSRS. BRITTE & BACON, ARCHITECTS, NEW YORK, N. Y.

COTTAGE RESIDENCE FOR M. W. NORTON, ESQ., HARTFORD, CONN., IN 1899. MR. F. R. COMSTOCK, ARCHITECT, NEW YORK, N. Y.

THE interior of this cottage is entirely of white pine, with the exception of the shoe of the base at the floor and all interior window-sills, also hand-rail of stairs, and all interior doors of building, which are of selected red birch stained mahogany. The floors are of quartered oak. The manner in which the staircase-hall opens up from the entrance, and the connecting rooms, with the general scheme of decoration, make a very pleasing effect.

[The following named illustrations may be found by reference to our advertising pages.]

THE SPANISH BUILDING: PARIS EXPOSITION OF 1900.

THIS plate is copied from *La Construction Moderne*.

PORTICO OF THE CHÂTEAU D'EAU: PARIS EXPOSITION OF 1900. M. EDMOND PAULIN, ARCHITECT.

THIS plate is copied from *l'Architecture*.

[Additional Illustrations in the International Edition.]

BATTLE MONUMENT, WEST POINT, N. Y. MESSRS. MCKIM, MEAD & WHITE, ARCHITECTS, NEW YORK, N. Y.

[Gelatine Print.]

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[Gelatine Print.]

MASONIC TEMPLE: HOLBORN RESTAURANT, LONDON, ENG. MR. T. E. COLLCUTT, ARCHITECT.

RIVER FRONT: SHILLINGFORD HILL, BERKSHIRE, ENG. MR. GEORGE HORNBLLOWER, ARCHITECT.

THE QUADRANGLES: LINEN AND WOOLLEN DRAPERS' INSTITUTION COTTAGE HOMES, MILL HILL, MIDDLESEX, ENG. MR. GEORGE HORNBLLOWER, ARCHITECT.



THE COURTS ON THE RIGHT TO LABOR.—The right of an employer to discharge an employé without being criminally liable for so doing has just been asserted, says the New York *Evening Post*, in a vigorous opinion by Judge Waterman of the Cook County (Ill.) Criminal Court. An employer had been indicted under a section of the criminal code which assumed to make it a criminal offence, punishable by fine and imprisonment, for an employer to prevent an employé from joining a "lawful labor organization" or to discharge him "because" of his connection with such an organization. In quashing the indictment the judge said: "Liberty includes the right to acquire property, and also includes the right to make, to enforce, and to terminate contracts, subject only to such civil obligations as may ensue from such making and such termination. Liberty includes not only the right to labor, but to refuse to labor; and consequently the right to contract to labor and to terminate such contract—in other words, to break it." It followed, the judge said, that "the right to hire labor and the right of the laborer to work and to agree so to do, the right to discharge and the right to abandon service, are all essential parts of the property right of contract, and protected by the constitution. Nor can these rights be destroyed or impaired by legislation pronouncing criminal a discharge or refusal to work for what is legislatively declared to be an unlawful or unworthy motive." And Judge Waterman added this as to freedom: "One of the essentials of freedom is the right to have opinions not in harmony with those of the public authorities or of the majority. The major portion, if not all of the prejudices of mankind, are foolish; nevertheless, free men are entitled to hold prejudices. The constitutional guaranty to every person of the right to freely speak, write, and publish on all subjects, necessarily involves the right to have opinions on all subjects, however much they may be condemned either by the legislature or the public. Every citizen has a constitutional right to believe the Presbyterian, the Catholic, the Unitarian, the Mormon Church, or the journeymen plumbers' labor organization to be prejudicial to good morals and harmful to society; so believing, he has a right to attempt to prevent the tutor of his children joining such society, and to discharge such teacher if he persist in uniting." So much boycotting, picketing, wrangling, and fighting is now going on over the rights of free men to work at their trades in this land of free institutions that the language of Mr. Justice Bradley, of the United States Supreme Court, in the celebrated slaughter-house cases (16 Wall., 38), might well be spread broadcast for general reading. He said: "The Declaration of Independence, which was the first political act of the American people in their independent sovereign capacity, lays the foundation of our national existence upon this proposition: 'That all men are created equal; that they are endowed by their Creator with certain inalienable rights; that among these rights are life, liberty, and the pursuit of happiness.' Here, again, we have the great threefold division of rights of free men asserted as the rights of man. Rights of life, liberty, and the pursuit of happiness are equivalent to the rights of life, liberty, and property. These are fundamental rights which can only be taken away by due process of law, and which can only be interfered with, or the enjoyment of which can only be modified, by lawful regulations necessary or proper for the mutual good of all; and these rights, I contend, belong to the citizens of every free government. For the preservation, exercise, and enjoyment of these rights, the individual citizen, as a necessity, must be left free to adopt such calling, profession, or trade as may seem to him most conducive to that end. Without this right, he cannot be a free man. The right to choose one's calling is an essential part of that liberty which it is the object of government to protect; and a calling, when chosen, is a man's property and right. Liberty and property are not protected where these rights are arbitrarily assailed."

CHARLES BARRY, ARCHITECT.—We regret to announce the death of Mr. Charles Barry, F.S.A., past-president of the Royal Institute of British Architects and Royal Gold Medallist, of Stanley House, Forest Hill, and Parliament Mansions, Westminster, eldest son of the late Sir Charles Barry. Mr. Barry, who died June 2 at Victoria-terrace, Worthing, was born in 1823, and was therefore in his 77th year. He was educated at Sevenoaks Grammar School, and was trained in his father's office for the profession of an architect, and for several years assisted in various important works, including the Houses of Parliament. Subsequently, Mr. Barry had an extensive and varied practice, and among his larger undertakings may be mentioned Burlington House, Piccadilly, the College at Dulwich, and the great Industrial School at Feltham for the County of Middlesex. One of his most recent works was the new Institution of Civil Engineers in Great George Street, Westminster, built at a cost of £60,000, which will probably be removed in a few years' time to make way for Mr. J. M. Brydon's new Government Offices. He was architect for the Dulwich College estates, and as such designed the Passmore Edwards Free Library in Lordship Lane, S. E. He was frequently consulted as referee in competitions (including that for the Glasgow Municipal Buildings) and as arbitrator. Some years since he took his son, Charles Edward, into partnership. He joined the Royal Institute of British Architects as an Associate in 1846, became a Fellow and Life-member in 1854, and in 1876 was elected President of the Institute, and held that position

for three years. In his second year of office, 1877, he was nominated by his colleagues to receive the Royal Gold Medal for eminence in architecture, a distinction which twenty-seven years previously had been conferred upon his father. He was one of the Royal Commissioners for the Paris Exhibition of 1878, and acted as the sole representative British member of the small international jury of the Fine Arts section for making the awards for architecture from the various countries represented. In recognition of this service the French Government, at the instance of the Prince of Wales, conferred on him the distinction of the Cross of an Officer of the Legion of Honor. He was also an honorary member of the Imperial and Royal Academy of Arts in Vienna. His wife, the daughter of Mr. Thomas May, of Exeter, predeceased him. Of his brothers, one, Sir James Wolfe Barry, K.C.B., LL.D., F.R.S., is a past president of the Institution of Civil Engineers; the late Mr. Edward Matthew Barry, F.R.I.B.A., was Professor of Architecture at King's College, London; and a fourth son of Sir Charles is Dr. Alfred Barry, who was from 1884 to 1889 Bishop of Sydney, New South Wales, and now holds a Canonry at Windsor. — *Building News*.

DAMMING THE NILE.—Herophilus is said to have described the best quality of a physician as "the power to distinguish the possible from the impossible." This is also true to-day of the world's engineers, and one cannot but wonder what the immortal shades hovering about Philæ think of the five years' work which has for its object the damming of the great river which for countless ages has leaped joyfully through the granite rocks. The work of the last two years has been so far a great success, and now at lowest Nile all the eastern channels are stopped and a huge granite wall is rising like a mighty breakwater. An army of 7,000 Egyptians is working at a high rate of pay, and about five hundred Italians are cutting granite, because they do it so much more quickly and better than the natives. All are under the orders of 160 British artisans, and practically all the engines and railway plant and huge cranes have come out for the work from England. And the present motto is "Hurry!" because in three months the Nile flood will be down, and then no more can be done to strengthen foundations and to eat out the gray granite which is not considered good enough to take part in a work which will some day rival the Pyramids and the Suez Canal, and stand, whatever may happen, as a permanent monument of the English occupation of Egypt. The low Nile of this year is a nuisance to every one but the engineers at Assuan, because it enables them to delve down sometimes 100 feet to look for faults in the rocks and to blow up with dynamite any masses of doubtful consistency. At a quarter to twelve every morning a warning syren sings and every one scuttles away from the works to lunch and safety, with the exception of half a dozen firemen who remain behind. At noon the syren is again heard, and from a vantage ground in the distance the men can be seen running nimbly about the abysses to light the fuses to which the long dynamite cartridges are attached. And then is heard a sort of artillery *feu de joie*, and for ten minutes at intervals, masses of granite hurtle through the smoke and plunge into the pools of water yards away. And all this work must go on every day except Sunday and except during the three months of the Nile flood, until three more years are over, and the Europeans must be content to live without luxuries in mud-brick huts, the walls of which are often made 3 feet thick. For this is the only way to keep out the sun by day and to get comparatively cool nights in a tropical summer where the midnight temperature is often as high as 100 degrees Fahr. But the men are healthy enough, and those who do not drink and who wear huge helmets stand the hot sun very well. — *Correspondence London Lancet*.

THE MARQUIS OF BUTE'S CASTLE.—Our multi-millionaires are not the only builders of palaces. No less a personage than Lord Bute has been twenty years at the construction of a princely seat in the island of Bute, but not until the chapel, now almost completed, is ready will Mt. Stuart be truly finished for all future generations. The entrance-hall of the house has alone cost \$500,000. Monolith columns of rare and beautiful marbles support the arcaded gallery, which, in its turn, is rich in marble and bronze, and blazes with blue and fawn color and gold. The floor is like that of the Colonna Palace in Rome—huge blocks of purple porphyry and marbles of infinite variety and hues and markings. Marble has been used lavishly throughout the whole house. Only one room, says a recent visitor there—the pleasant "garden parlor"—is without it, and here the woodwork and white paint are a charming change from the somewhat oppressive stateliness of the rest of the great building. Not one library contents the Marquis of Bute. He has three, the white, red and blue libraries opening out of one another, and bearing evidence of his eclectic taste, not only as regards the contents of the shelves, but the scheme of decoration and the few priceless pictures which find place on their walls. The dining-room is chiefly remarkable for an exquisitely carved antique mantlepiece, in purest Parian marble, and for the graceful crystal shields to the electric-lights. The crypt of the unfinished chapel is now used for daily service, and here the Roman Catholic residents in Bute are always welcome. The superstitious people of Rotheray believe, when the sound of the masons' trowels and the carpenters' hammers shall cease at Mt. Stuart, where they have been busy for nearly a quarter of a century, the knell of the marquis will be sounded! Perhaps he can persuade the workmen to go on a strike, and so delay matters a bit. — *Boston Herald*.

A TURNER STORY.—An old but good story of Turner is again going the rounds. It is related that a rich and supposedly cultured woman once called on the great English artist. It was before he had become the fashion. The visitor took exception to the colors in a landscape. "Why, Mr. Turner, I have seen that place ever so often, and I am sure I never saw such colors as those." "Indeed?" Turner answered with real or affected surprise and concern, "but don't you wish you could, madame?" — *N. Y. Evening Post*.

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SUMMARY:—

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THE *Electrical Review* suggests an advance, now easy to make, toward providing Manhattan Island with more efficient protection against fire. It points out how easily, now that the electric-power cables for surface and elevated cars are installed, these could be furnished with public junctions to which the fire-department could instantly connect the electric fire-pumps with which the department could be equipped in place of the heavy and dangerous fire-engines that have now to be drawn through our streets at a gallop, endangering the lives of those upon the street and the abutting property, in peril in the summer time from the boiler-sparks that may fall upon the window awnings, to say nothing of the risk to the firemen themselves, who are often hurt through the overturning of their top-heavy machines. Powerful electric-pumps capable of throwing several streams could, being lighter, be drawn through the streets more safely and at greater speed than the present cumbersome steam apparatus, and more of those precious "first moments" could be saved. The suggestion seems to us so sensible that we hope not only the New York fire-department will act on it, but other departments wherever electric-power cables are accessible. But the idea, good as it is, does not go far enough. The ubiquity, so to speak, of electric force nowadays suggests the possibility of putting the art of fire extinction on a more modern and scientific footing. The rush through crowded streets of ponderous fire-apparatus is uncivilized, and though it is exciting and picturesque it is not worth while to perpetuate the practice simply because of these attributes. It will be small compensation to the pedestrian to know that he has been maimed by the passing lighter electric-pump apparatus going at higher speed, and not by the heavier steam apparatus travelling at a somewhat slower rate. The citizen who succeeds in banishing these Juggernaut cars from our streets in all but exceptional cases will deserve well of his fellow-men. The powerful portable apparatus will probably always be needed to meet the exceptional circumstances and to cope with unusual conditions: but for most conditions it seems as if, now that electric power is so widely distributed, small stationary electric fire-pumps might take the place of the present apparatus to great advantage both to life and property.

IT has been our fortune to see from our own office-windows the outbreak of fire in three or four neighboring buildings, and observe not only how slow, seemingly, the first engine was in reaching the spot, but how agitatedly impatient the policeman on post was, and how simple a thing it would have been for him to put out the fire if he had had fire-apparatus at hand under his own control. It seems to us the time has come for

the establishment of auxiliary fixed fire-apparatus subject to the control of the policeman on post and the fireman on patrol duty, and that electricity can be called on to provide the needful power where hydrant-pressure is inadequate. To equip each of the four streets that bound a square with a serviceable length of light hose and a single electric-pump for each block would, of course, call for an enormous outlay, but at the same time the protection afforded would be commensurate, and very possibly building owners who now furnish their own buildings with fire-hose upon each floor would be willing to provide at their own expense the light hose we speak of for service from the street, and there is no building where the needed small space for the tunnel or tube needed to receive in unbroken lengths four or five hundred feet of light hose could not be provided without inconveniences, along the whole length, say, of a party-wall. A policeman or a fireman on patrol with such an apparatus, supplemented by extra hose on a hand-reel kept at a convenient place in the block, could extinguish many a fire before the distant department apparatus could reach the spot, and besides preventing destruction by fire, would avoid the great damage that is usually caused by the use of the large engine streams.

MR. J. R. THOMAS, architect of the new Hall of Records in New York, is not having an easy time in getting that structure into the condition where it can be occupied as intended, and we fear that he may be equally hampered in collecting payment on account of his professional services, as the present financial watch-dog of that city is a person of a very stern virtue. Our readers will recall that just a year ago Mr. Thomas was informed by the Mayor and his advisers that his scheme for treatment of the interior of the building was altogether too elaborate and costly for them to approve, and he was instructed to go over his plans and drawings again and effect a saving of at least a million dollars on his own estimate of their cost, two-and-one-half millions. We infer from the time that has elapsed that the unfortunate architect has found his task a very complicated and tedious one, and we can conceive the relief with which he knew that the day for opening the bids had come at last; but we shrink from imagining his feelings when he found that they were not to be opened, after all, because certain contractors entered complaint that through the obstructiveness of the architect they had not been allowed time and opportunity to examine the drawings, while certain favored contractors had been allowed to "take the drawings home." This last complaint we fancy was made by an old-fashioned contractor who supposed that all figuring had to be done upon a single set of drawings—the original ones—as used to be the case in the days before the introduction of the blue-print and manifolding typewriter. As New York officialdom has selected the Hall of Records as the public proof of its great virtue, no matter how much the unfortunate architect might suffer, it probably welcomed another chance of exhibiting its Spartan virtue, and it was voted that none of the four bids received should be opened, but that the contract should be readvertised. The fact that this ruling lays the city open to suit by the four bidders who have complied with the original invitation is a matter that causes the officials no distress: perhaps, even it may be a move to enable these bidders, if they happen to be political hangers-on of the dominant party, to get fat judgments against the city treasury because of breach of contract.

MR. THOMAS has companions in his misery, for the architects of the City Prison and the designers of the Soldiers' and Sailors' Monument have been treated quite as shabbily, on one pretext and another. The latter gentlemen doubtless felt that the recent dismissal of the injunction against placing the monument on its selected site on Riverside Drive removed the last bar to the orderly progress of their work, and were preparing to award the contract to a satisfactory bidder, when the award was delayed because of the protest of one of the unsuccessful bidders. This party alleged that the successful bid was informal and must be thrown out—probably to his own advantage—because a sample of the marble to be used had not been submitted with the bid. One would think that such an objection as this could be disallowed or admitted in five minutes by the architects or the Commissioners, who must have

been conversant with the fact that a sample of the material was or was not required to be submitted by the terms of the published advertisement or of the contract. But the authorities chose to delay this undertaking once more and ordered the matter to be submitted to the Corporation Counsel, a man greatly skilled in discovering ways of avoiding the doing of things which Tammany prefers should not be done, and Tammany, perhaps remembering the Draft Riot, seems to dislike the idea of a military monument.

It evidently behooves those who have charge of building operations in municipalities which require the issue of permits of various kinds not only to get the number and variety required, but to make sure that the official who issues them actually has the legal right to do so. A suit was recently brought in the New York Supreme Court by a householder on the Riverside Drive, at Eighty-second Street, to compel her neighbor to remove that portion of the front of his house which projected three and a half feet beyond the building line. The owner demurred and exhibited a permit allowing the encroachment, issued by the President of the Park Department. The Court, however, held that the department had no authority to issue such permit, and consequently awarded damages to the plaintiff in the sum of twenty-five hundred dollars. But it would not order the owner of the projecting structure to tear down his front and rebuild it within the proper line, assigning as the reason the fact that the complainant had seen the work of construction going on, had made no complaint and had asked for no injunction, a ruling which sounds as if the Court in question would hold any one blameless for breaking a law unless some one complained at the moment of the infraction.

It is asserted by those who undertake to keep records of the matter that in the first six months of this year, the most active months of the year, the gross estimated cost of new building operations in the New England States amounts to some fifty-three million dollars, a sum respectable enough in itself, but not imposing when the number and wealth of the population is considered. Accepting this statement as accurate, it is possible to deduce from it the maximum average income of the individual architect and ascertain how desirable a profession it is from the worldly point-of-view that architects are following. It is only fair to assume that at least half of the sum to be expended is for buildings of such small size or character that the aid of an architect is not required, and so this part of the total escapes being taxed for the architects' benefit. If architects secure a full five-per-cent commission on the remaining twenty-six millions they have an income of thirteen hundred thousand dollars gross to divide between them, or after deducting the inevitable fifty per cent for office expenses, the net sum of six hundred and fifty thousand dollars. This divided between the three hundred and fifty architects established in New England indicates a possible personal income for each of rather less than two thousand dollars, an income which would enable many professional men to live in quiet comfort and keep up appearances sufficiently to attract new clients. But owing to one circumstance or another this average income is not attainable. In the first place, the work is not evenly distributed, some offices getting a disproportionate share of it and others getting none at all; and in the second place the full commission is not collectable on all the work that architects do, those who have difficulty in getting any work to do being compelled to accept what they can get if they would keep soul and body together; moreover, all work done in New England is not in the hands of New England architects. If, then, the share which falls to the favored few who have the good fortune to do most of the expensive work be subtracted, it will be found that the income of the average practitioner more nearly approaches one than it does two thousand dollars, the income, that is, of the average clergyman, country doctor or book-keeper, upon whose shoulders rest a lighter load of responsibility. The income nominally to be derived from the work undertaken during the less-active last half of the year can be set against losses from disputed accounts, abandoned jobs and so on.

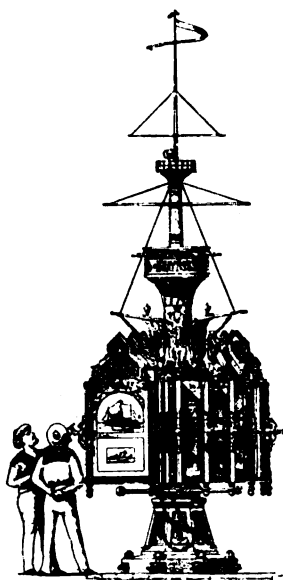
Of course movements in the making of international history are not exactly within the scope of a professional journal, but as all architects, from the time of the ancients down through Leonardo da Vinci to Viollet-le-Duc and later, have taken a quiet and often a lively interest in military architecture, we cannot forbear to call attention to the instruction presently

to be derived from a detailed description of the phenomenal character of the defensive fortifications about the British Legation buildings at Peking, fortifications devised with such incredible skill as to remain sound after being "under continued fire from shot and shell" for two or three weeks, as the astute Chinese diplomats would have us believe.

At the Paris Exposition is shown a device for registering telephone messages, which is already in use in Denmark, and seems likely to be of great value. Although the inventor, M. Poulsen, a Danish engineer, has been several years in perfecting the device, it is, like most deeply studied inventions, very simple. In substance, the registering instrument consists of a steel wire, of the kind known as piano wire, or a ribbon of the same material, which moves between the poles of a small electro-magnet, excited by the telephone current. Every one knows that steel, when magnetized, retains its magnetism indefinitely, and that steel can be magnetized by the action of an electro-magnet upon it. Whenever a current passes through the telephone wire, and around the electro-magnet, the latter is excited, and permanently magnetizes the spot on the steel wire, or ribbon, which is at that moment next its poles. A strong current strongly magnetizes the adjacent portion of the wire and a weak current magnetizes it weakly, so that, as the wire or ribbon is drawn between the poles of the magnet, it is impressed with a variegated succession of spots, which are permanently magnetic, and do not change in their relative position or intensity. In order to read the message impressed on the recording wire, it is only necessary to draw the latter, at a uniform speed, between the poles of another small electro-magnet, interposed in the circuit of the receiver of another telephone. As the differently magnetized spots pass the magnet poles, they induce currents, which repeat in the receiver of the instrument the message originally recorded. The magnetism of the record wire is not injured by the operation of reading, and this may be repeated indefinitely. By using a flat steel band instead of a wire, the width of the spots can be increased, so that the message can be read from the record in several receiving instruments simultaneously. The irregularly magnetized wire or band, simple as it is, gives a record of extreme delicacy. The impression produced by several persons talking at once is recorded and reproduced so clearly that the different voices can be distinguished and the contribution of each to the conversation separately understood. There is no difficulty about making the motion of the record wires automatic, so that a person can put a wire in his telephone, and go away and leave it, reading, after his return, the messages that have been transmitted through it, and the wires recording important conversations may be preserved. The other wires, which it is unnecessary to preserve, may be restored to their pristine condition by passing them at a uniform speed between the poles of an electro-magnet which is kept constantly excited. The steady and strong current obliterates the impressions made by the weak and irregular one, and the wire is then ready to be used again.

An editorial writer of the New York Times is very much agitated by the decision in an elevator-accident suit [Egan vs. Berkshire Apartment Association (31 N. Y. S. R., 545; 10 N. Y., Supp. 116)] which states that "the owner of a building is not bound to so provide for the safety of passengers that they shall encounter no possible danger and meet with no casualty in the use of the elevator," and he asserts his belief that whenever there is an elevator accident it is "prima facie evidence of a negligence which, if attended by death or a bodily injury, can only be regarded as a crime," and consequently the owner of the building should be punished for its commission. As to the writer of the editorial, whom from internal evidence we suspect to be the writer of an article inveighing loudly against the iniquity of assessing salvage claims upon the owners of the salved ocean-liner "*Kaiser Wilhelm der Grosse*," because the line of reasoning is so completely reversed, we hope he may never be held to a pecuniary responsibility for any of the accidents for which each man of us is more or less responsible at some time during his life. As to elevator accidents, we find the decision of the New York Court quite in accordance with our own expressed views, for we recall suggesting, some years ago, that owners of buildings served by stairs and elevators should place at the entrance to elevator-cars a notice to the effect that "the owner has provided stairs: elevators will be used only at the personal peril of the user."

SOME PHASES OF PUBLIC SANITATION.



Picture Show-case for the Russian Navy Department. From *Stroitel*.

WE are told that there are no such things as dirt or sin, what are commonly called by those bad names being good, useful material, and strenuous conduct in the wrong places. In our present social condition there are various matters that concern the physical well-being of people who live so near together that they cannot help influencing one another, matters which are partly controlled by public, or concerted action. To call attention to some of these is the purpose of this article. Without discussing the gospel of germs, good or bad, the mysteries of organic chemistry and biology, or the contradictions and complications of vital statistics, it will be assumed in these suggestions about public sanitation that cleanliness means health, and filth means disease.

As everybody knows, or ought to know, Springfield, the royal queen of the Connecticut Valley, the home of the United States Arsenal, of the doughty Springfield Republican, and the ubiquitous "Webster's Dictionary,"

is the most beautiful city as to its natural environment, the most civilized city as to its social and political condition, the most artistic city, barring its architecture, in the world, not excepting Chicago and the New Jerusalem. Still, I have ventured to take it as affording concrete illustrations of sundry faults, which, so far as I have been able to observe, exist in many, if not in all, of the provincial cities and towns of New England, not to mention other parts of the country. Concrete illustrations of moral and material matters are more impressive and convincing than abstractions; I could not, in courtesy, hold up the shortcomings of any other city, and I am sure it will be understood that chastisement in my own family, so to speak, is of the loving kind.

So much by way of preface; here is the beginning of this chapter.

We who live in Springfield sometimes indulge in modest eulogiums of its cleanliness, beauty and progressive spirit. Our self-felicitations are usually based upon comparisons with other cities. But it is of no consequence whether we are cleaner or dirtier than our neighbors [of course we are cleaner] if we are a great deal dirtier than we ought to be, and it is unquestionably true that we are inexcusably dirty. We are so dirty that if we really knew what it is to be clean, if we had been clean long enough to have become accustomed to cleanliness, and then, by some magical and malignant influence should find ourselves back in our present condition, we should shut up our shops, send our women, children, old folks and invalids out into the woods, and not allow them to come back until we had been washed and dried and disinfected.

Our principal business street is not the dirtiest street in the city, far from it, neither is it the cleanest; it will serve as an illustration. Certain portions of it, like other streets in the city, are paved with granite blocks. To prepare for these, the bed of the street is excavated to the depth of about eighteen inches, and two-thirds of that depth is refilled with dry sand, into which the blocks are set edgewise. Their adjacent sides are so rough that the cracks between them will average half an inch in width. After the blocks are permanently put to bed and pounded down, those cracks are partly filled at the top with loose sand lightly swept into them. But they are not allowed to remain partially filled. The sweepings from the buildings along the street, the comminuted excreta of horses, dogs and sparrows, soaked and decomposed waste paper, parings of fruit in various stages of decay, cigar stumps and the ruminant results of the chewing habit, are all made into a sort of fluent paste by admixture with sundry fluids, mentionable and unmentionable, which paste is gradually washed by the street sprinklers and by the clean rains from heaven into the cracks between the stones, the cracks being merely conduits leading to the absorbent layer of sand underneath.

The originally clean and innocent bed of sand is rapidly adulterated until it becomes a rich, black, fragrant compost. The only days in the year when this blackness and sin are not brought to the surface in the interest of new sewers, or the rebuilding of old ones, of water and gas pipes, telephone, telegraph and electric-light tunnels, are the thirty-first days of June and November.

When there is a drizzling rain, the paving-stones are covered with a vicious and viscous slime that might have been taken from an old sink-drain or cesspool. A smart summer shower occasionally washes the most of the visible loose material into the sewers, but enough remains in frequent pools to send forth odorous exhalations, until they gradually dry up and are converted into street dust that is carried into all the buildings along the street that have open doors and windows, and into the lungs of all the people that have open mouths and noses.

Instead of giving the streets such a solid foundation, and their surfaces such shape that all the water would run off quickly to the sewers at either side, carrying the unclean sediment with it, the pavement, whatever its character or original form, soon becomes so sunken and hollowed in places that samples of liquid compost are always in evidence during the rainy and sprinkling seasons.

In addition to the local supply of raw materials for the manufacture of filth on our most important thoroughfares, they are constantly receiving accessions from the unpaved courts and alleys that pass behind the buildings. Here is the back-door output from groceries, restaurants of all grades, markets and saloons; here are the gathering places, the battle-fields for cats and dogs, and dumping-grounds for the sweepings that will not be tolerated at the front door. Out of the darkness and the dirt of these unholy regions the wheels of the heavy wagons and the feet of the draught-horses come laden with matter out of place, which is speedily shaken off upon the hard surface of the paved streets; then we wonder how the streets that were cleaned the night before can get dirty so soon. If the private owners of the back alleys in some portions of the city were obliged to pay one-half the cost of cleaning the principal streets, which would in some cases be no more than just, they would soon find it for their interest to keep the alleys themselves clean. If this would be good economy for the private owners it would be no less so for the city.

As for the sidewalks on which our wives and daughters and young lady friends trail the tails of their tailor-made gowns, they are perennially decorated with the expectorations of sufferers from nasal and pharyngeal catarrh, bronchitis and incipient tuberculosis. The fluid extract of tobacco and the contributions made by the saloon patrons who are suddenly attacked by uncontrollable nausea, may be less dangerous, but they are no more agreeable.

Disposing of the so-called waste of large cities is of ancient date. Babylon and Nineveh, Jerusalem and the dead and buried cities of Egypt had their sewers. The Cloaca Maxima, which is a small affair in comparison with some of the sewers of modern times, has carried more or less of the sewage of Rome to Father Tiber, and Father Tiber has carried it to the sea for twenty-five centuries. That the world to-day would have been vastly richer if much that has been poured into the sea could have been wisely resolved to earth again, is undoubtedly true,—Victor Hugo has told us how many millions Paris throws away every year,—but the sanitary side of the question of sewage disposal is more important to this generation than the economic.

It is only within a few years that we have made the astonishing discovery that it is dangerous to carry the drainage from sinks and water-closets to a leaking cesspool within a few feet of the spring or well from which our drinking water is drawn, and we are piously pleased to know that the opulent city below us is no longer compelled to drink the sewage of Holyoke, Springfield, Chicopee, Thompsonville and Windsor, variously flavored by the chemical mysteries discharged from the cleansing, dyeing and disinfecting departments of paper, silk, cotton and woollen mills. It is pleasant to observe a growing refinement, possibly a fastidiousness, in regard to drinks.

To speak soberly, even if it is true that the impurities that are poured into the Connecticut and scores of other rivers by the thousand gallons daily are diluted and filtered and distributed along the fertile banks of the streams (which the good Lord undoubtedly meant to be clean and beautiful), until the mischievous microbes in a square inch can be counted, say in a few hours, by the aid of a microscope and the multiplication table, even after this cleansing process, there must still be a moral and spiritual degradation in the consciousness that when we drink from the river, as we may at any time be compelled to do, we are drinking from an open sewer. How much worse are the cannibals? They eat one another, the choice portions, let us hope; we drink,—well, we can hardly afford to pursue the parallel any farther. Of course, this is a scientific, that is to say, a matter-of-fact, age, and science, if anybody, knows what is good to eat and drink; but sentiment is not wholly obsolete, and refined sentiment, natural instinct, the intuitive perception of the eternal fitness of things, all protest against slaking our thirst with water that has just been used to wash out sinks, latrines and dye-tubs, even if it has been diluted, filtered and boiled. But this is not pleasant, and I will pass on to more agreeable themes.

Speaking in a general way, corruption goes by water and purification comes by fire. It would be a great gain if all that is combustible of household and other waste could be burned. Every private house and every city should have its beneficent Gehenna. Not that actual waste, either of force or material, is possible in the universe, but the matter out of place and the change from one form to another is what disturbs us, and the slower the change the worse. Whether there is really anything harmful in the natural decay of vegetation, whether it affords a congenial garden for malignant microbes, can only be determined by consulting the latest reports of scientific research in that field; but in autumn, when the ground is covered with sodden and decaying leaves, and in the spring, when the liberated moisture from the throbbing earth is alternately freezing and thawing, and the exhalations from the loosened sod fill the atmosphere with the odor of fresh mould, then there comes that sense of lassitude and weariness that can only be accounted for by the assumption that it is "something in the air." That many of the ills to which human flesh is heir do most abound at those seasons of the year when there is the greatest amount of unemployed wetness

in the atmosphere is a generally accepted, if not a well attested, fact.

Now, if one-half the trees that are planted and expected to grow in nearly all New England cities and towns are allowed to reach maturity, as many of them do, alas too soon, they are sure to maintain a condition of dewiness and dampness from which there is no escape. A visitor from a Western State whom I had taken to the top of the arsenal tower to admire the view, first admired it properly, and then told me that in spite of the verdant beauty of the half-hidden city, it seemed to him like looking into the valley of the shadow—not of death, exactly—but what may be worse, of chronic debility, catarrhs and intermittent fevers. He promptly declined, before I had time to offer it, to accept the best place in the city, if obliged to occupy it. Perhaps he was that dangerous person, an extremist; but so far as Springfield is concerned there is this to be taken into account—the greater part of the city sleeps upon a bed of clay, a huge mattress, a spring-mattress at that, more or less deeply covered with blankets of sand, which in many places merely keep the constant sub-surface water out of sight till it rises in the form of dews and fogs. It is not merely that the pre-historic bed of the river is still occupied by the sound sleepers that were laid to rest millions of years ago and are now lightly covered by partially paved streets and gutters, house-cellars and cesspools, but the higher land, farther back from the river, is generally of the same formation, a solid bed of clay with a layer of porous sand above it. This is by no means an ideal site for a city, and calls for especial vigilance in counteracting the naturally unfavorable conditions of dampness, conditions by no means confined to Springfield.

And yet, because we feel that it is an irreparable loss when one of our venerable elms is destroyed, sacrificed to some supposed demand in the way of public convenience, or to private greed, which rarely regards the public welfare at all, we fly to the other extreme, and allow ourselves to be overrun by trees as the ancient Egyptians must have been overrun by cats when they were considered sacred.

It can hardly be said of a city, as of a chain, that its weakest spot is the measure of its strength, but it is true that an unhealthy slum in any quarter is a constant menace to the whole. A truly civilized community would no more allow any precinct or street or tenement-house to remain with unsanitary surroundings, however hidden from common observation it might be, than an intelligent householder would allow that abomination of desolation known as a "back-yard" upon his premises, where decaying rubbish, open drains, rotting weeds and vegetables, broken bottles, empty fruit cans and piles of nameless garbage are left to their own unclean devices.

It may not be possible to compel the poverty-stricken residents of these unfortunate regions to love cleanliness for its own sake and because they understand how it affects their welfare, but there can be no doubt that if all the public and private alleys and streets that lead to the slummy districts and unclean tenement-houses were kept as clean as those in the best parts of any city the saving leaven would gradually work across the threshold. What else but dirt and filth have we a right to expect within the unwholesome abodes of the poor and ignorant, when there is nothing but ghastly uncleanness under their windows and beside their doors? Dirt, both moral and material, is as contagious as disease, in fact it is disease, and cleanliness, like health, is also stimulating and under favorable circumstances may happily become epidemic. Even if no higher motive can be found, that half-civilized sentiment known as enlightened selfishness should prompt us to use all possible means to compel the abject poor and the wilfully ignorant into sanitary conditions as we compel them to be educated for the safety of the community.

Among other things, this would lead to the paving and cleaning of streets for the benefit of the whole city, instead of following the lead of real-estate speculators and promoters, who, in spite of their visible enterprise in the way of rapid expansion, easily become a curse instead of a blessing. It is beyond all question the work of wisdom and benevolence to provide public parks for the enjoyment of those who have leisure to enjoy them on foot, wheel, or in their own two-horse chariots and automobiles; it is the work of angels to maintain clean, healthful and attractive surroundings for those who have no time, nor strength, nor clothes, and, alas, no desire to visit beautiful parks.

Of course we take pride in our school-houses. It has been suggested that we are inclined to excessive outlay for the higher and highest grades, to the comparative neglect of the younger innocents who are more susceptible to unsanitary surroundings. If that has been so in the past, it is probably not so at present, though it is not without significance that for the accommodation of eight hundred high-school pupils we have recently spent enough to have furnished the most complete, commodious, and, as far as we know how, the most sanitary accommodations for five thousand of the smaller children. The point which I wish to emphasize is that our sanitary efforts, at least in the matter of liberal expenditure, are directed mainly towards ventilation, which is by no means the whole of the gospel of health. It is not certain that Massachusetts people deserve much credit for this, because our good mother the Commonwealth threatens us with an application of the birch if we fail to give each pupil in the public schools thirty feet of outside air every minute. We hire a man to watch us and see that we are not delinquent, the expense of "installing the plant" is considerable, the patents bearing on the subject are numerous and delightfully intri-

cate, and when it comes to rectifying the mistakes and omissions of former architects, builders and committees, the field for experiment at the public expense is practically unlimited.

Of course, this is all well as far as it goes; we cannot, at least we are not likely to, have too much oxygen, but the outside air may be better and it may be worse than that indoors; it depends upon what sort of germs happen to be floating around near the mouth of the cold-air box; but ventilation by dilution does not absolutely ensure the healthful condition of public school-rooms. These same school-houses that are so generously supplied with outdoor air are swept with a dry broom once or twice a week, and a portion of the dust that accumulates is thrown into the dust-bin; the floors are mopped once a month—sometimes—and the porous, water-tinted walls are liable to be dusted twice a year. There is no good reason for supposing that the pathogenic germs, which would find comfortable quarters in the cracks of the floors and other woodwork, and in the porous substance of the plastered walls, are more than temporarily disturbed by this occasional sweeping and dusting. In fact, they are more likely to be waked up and stirred to greater activity.

It appears that in few, if any, of the principal cities of New England are the school-houses thoroughly washed more than twice a year, and only occasionally are disinfectants used with any regularity. When books are furnished by the State, they are passed from one pupil to another, and, in spite of rules to the contrary, lead-pencils are often taken from the common box. I think it would puzzle a bacteriologist to find a more satisfactory vehicle for the conveyance of undesirable germs than the moistened end of a chewed lead-pencil.

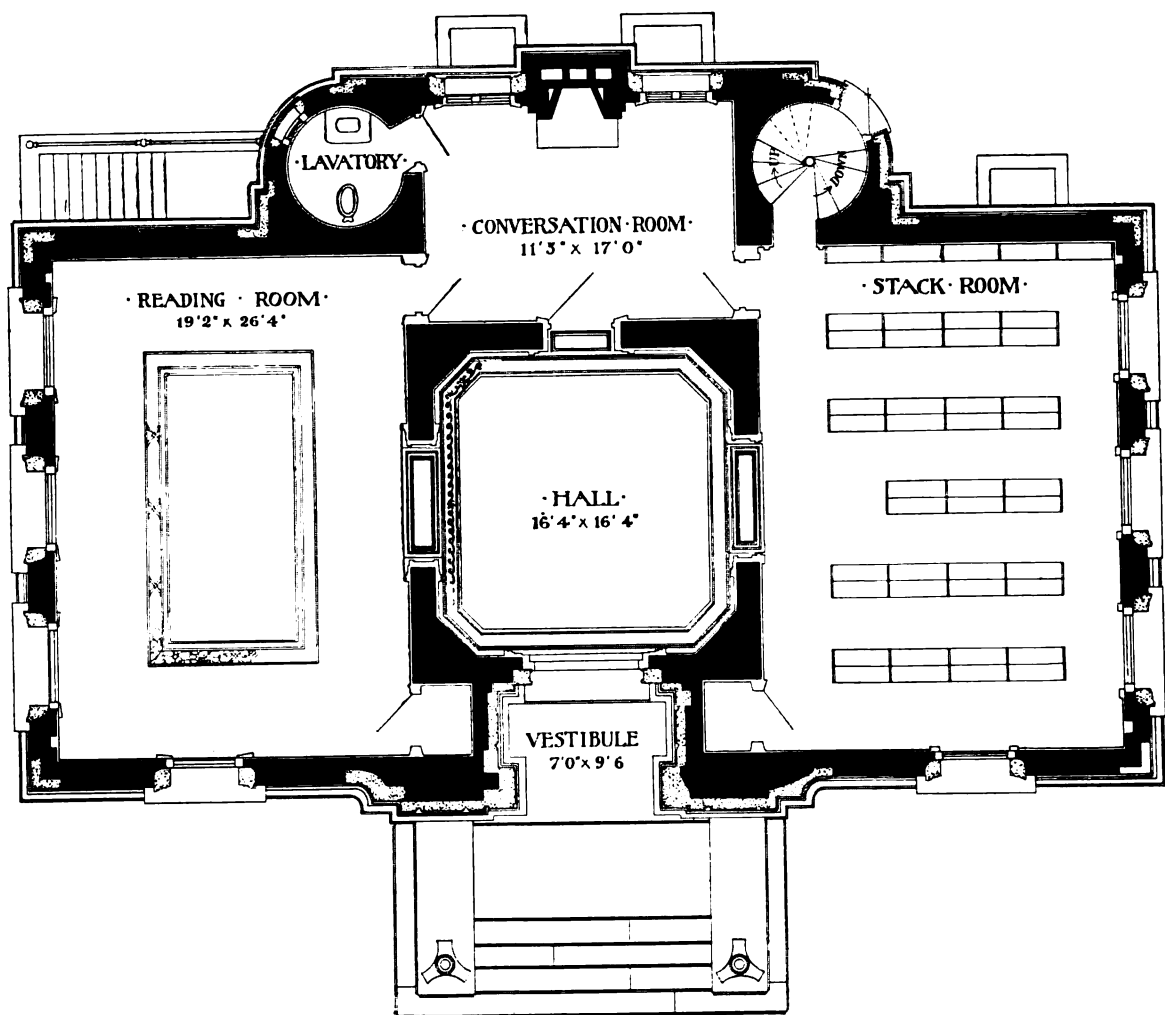
It is time for something besides coarse mortar, coated with white-wash or kalsomine, or water-colors of any sort, to be used for finishing the inside walls of school-rooms; something that can be washed with hot water and soap, something to which efficient disinfectants may be applied. It is time for such frequent and thorough disinfecting of all school-houses that epidemics of measles, mumps, diphtheria, scarlet-fever and grip, of which the school-house is often the central distributing station, shall not be considered matters of course when once the disease has been planted. Doubtless, such thoroughness would cost something,—it costs something in hospitals,—but the ounce of prevention is worth the pound of cure, and the most elaborate and radical cleaning that could be devised would not cover the cost of a dozen first-class cases of diphtheria, leaving the value of life out of the question.

By all means, let us have pictures and statues and frescos if we can get them and keep them clean. In mediæval monasteries, convents and churches, art and dirt are perennial twins. In a modern public school, as in a hospital, it is better to be clean than to be artistic. The elaborate tables of vital statistics give but a partial idea of the dangers that lurk in unclean school-buildings and their evil results. We may learn that so many died in each month of the year, in each ward, of diphtheria, croup and scarlet-fever, so many more were sick and did not die. But the long and patient nursing, the wearing nights and days, the agonies of anxiety, and the serious, often permanent debility or derangement that follow those whose lives are spared—these things are not recorded. But the proper sanitation of school-buildings is a subject for books, not for a single chapter.

Sanitary precautions are practically non-existent in all our vehicles for public conveyance, from Pullman cars to one-horse herdicars. Some of the "washable" materials must be cleaned occasionally or the great public would refuse to ride, the glass windows and the linen covers that "show dirt." The common coaches of the steam cars are so erratically heated and ill ventilated that the open-window nuisance is everywhere and has all seasons for its own. The only ventilation for the "box" electric cars is by means of revolving windows at the top. When the inside atmosphere becomes intolerably hot and insufferably foul, they are opened and the passengers receive the cold air—not slangily, but literally speaking—in their necks.

When the open cars have been brought out in the spring—the pneumonia cars—(and once out they are never put back except in case of a thunder-storm in the hottest of dog-days) all the passengers, whether they like it or not—and there is no doubt that many of them do like it, even if it kills them—are exposed from head to foot to a gale of wind blowing from five to thirty-five miles an hour. This is no open buggy drive, where feet and legs are protected by the front of the carriage and a lap robe, but the wind sweeps through the cars and through the by-no-means air-tight garments of the passengers like a blizzard on an open prairie. There is no reason why we should not have cars so constructed that a certain part of them must be sufficiently closed all the time to afford protection for those who desire it. There would be but few days in the year when it would not be grateful to some of the occupants. It is an impertinence even for the majority to say that because they like to ride in a gale of wind, everybody else must be compelled to, whether he likes it or not.

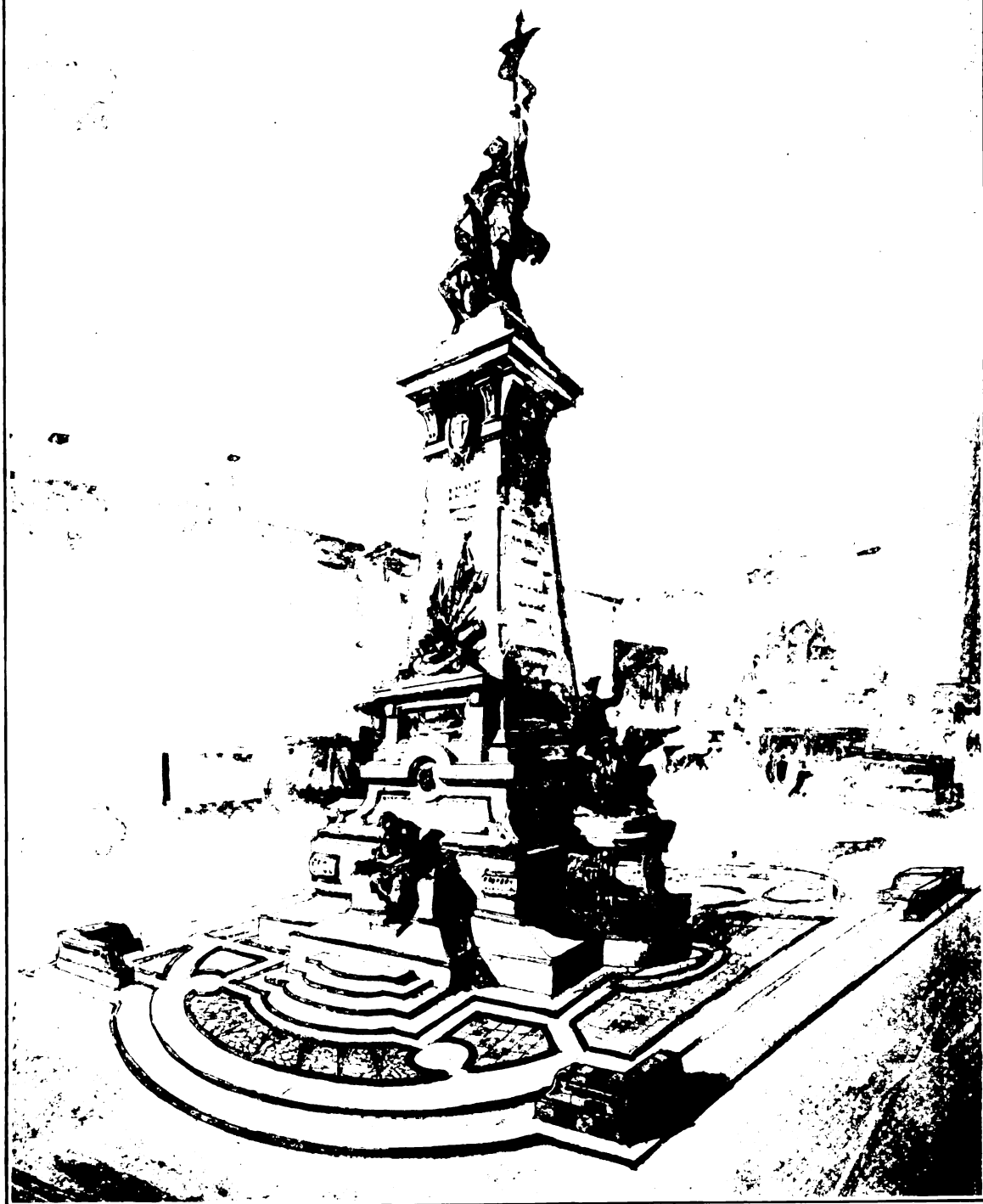
If plush cushions grew on the seats of public carriages as bark grows on trees, they would hardly be more universal. The only excuse for them is their economy. Nothing could be better adapted to hold matter out of place and keep it out of sight. Leather, real or artificial, has the merit of being washable, and bacilli-bearing dust can be swept off instead of being swept in. The draperies, blankets and foot-stools of the drawing-room and sleeping cars belong in the same category, only more so.



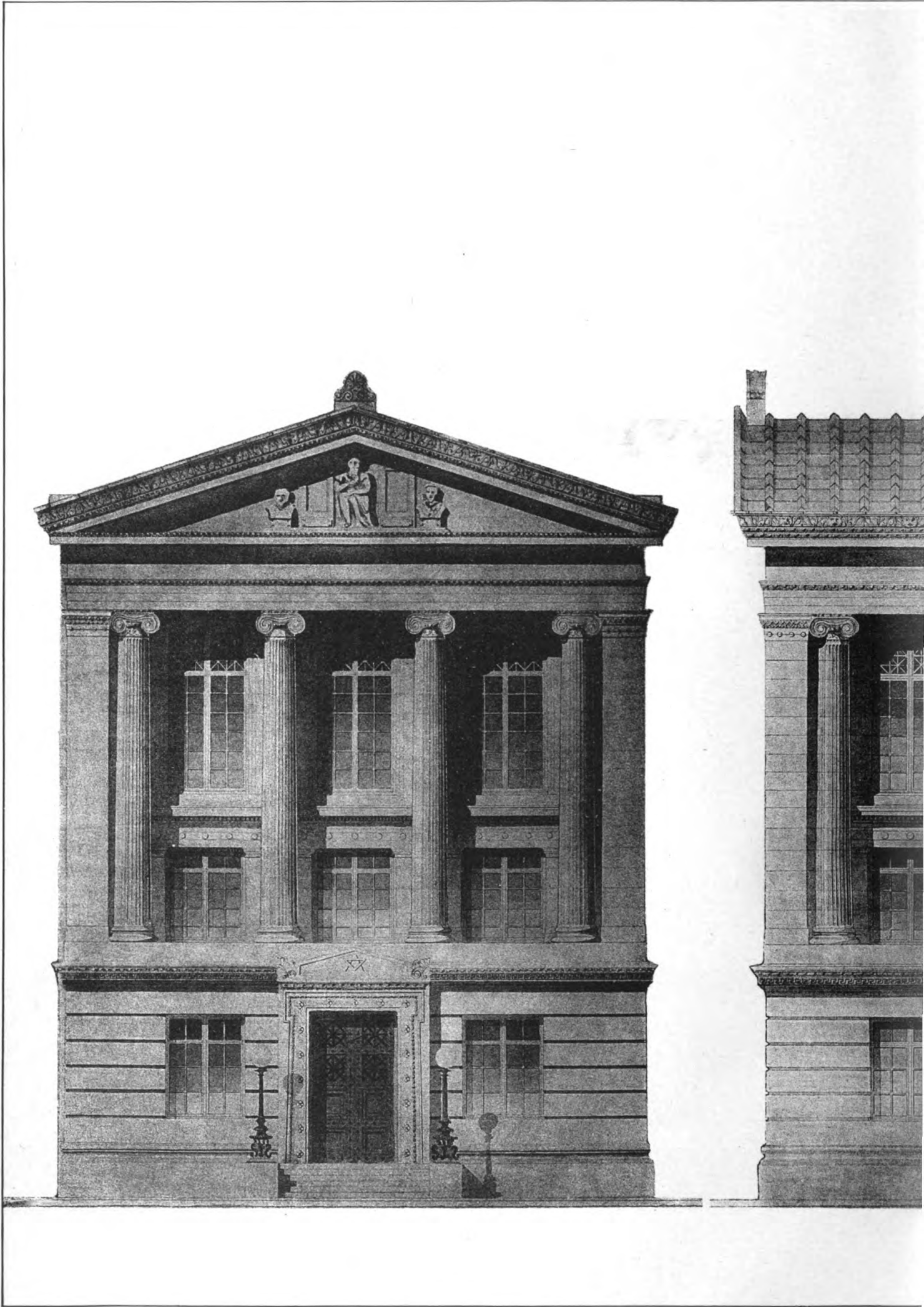
SCRANTON MEMORIAL LIBRARY, MADISON, CONN.
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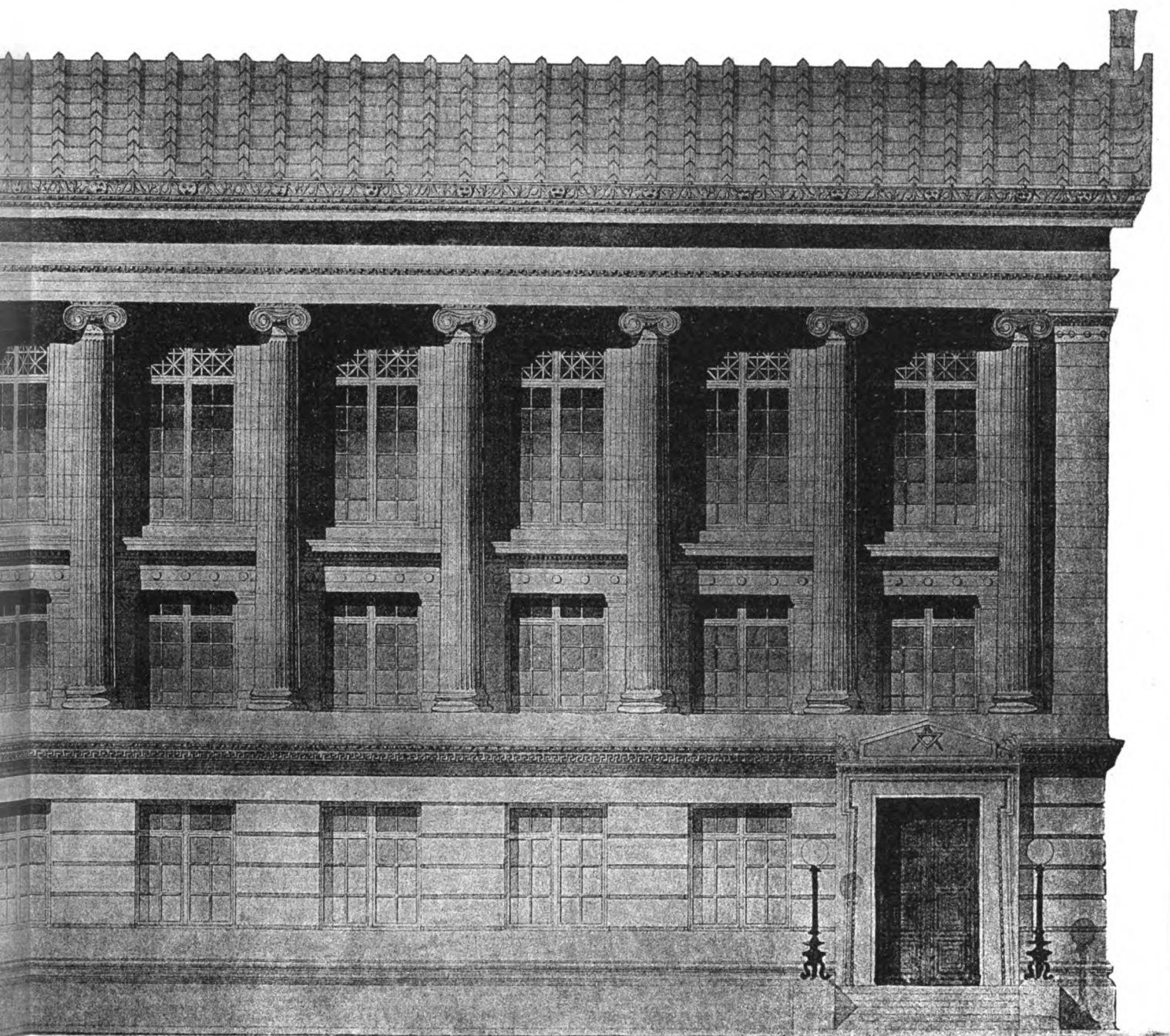
"MAINE" MONUMENT



J. H. FREEDLANDER, ARCHITECT.

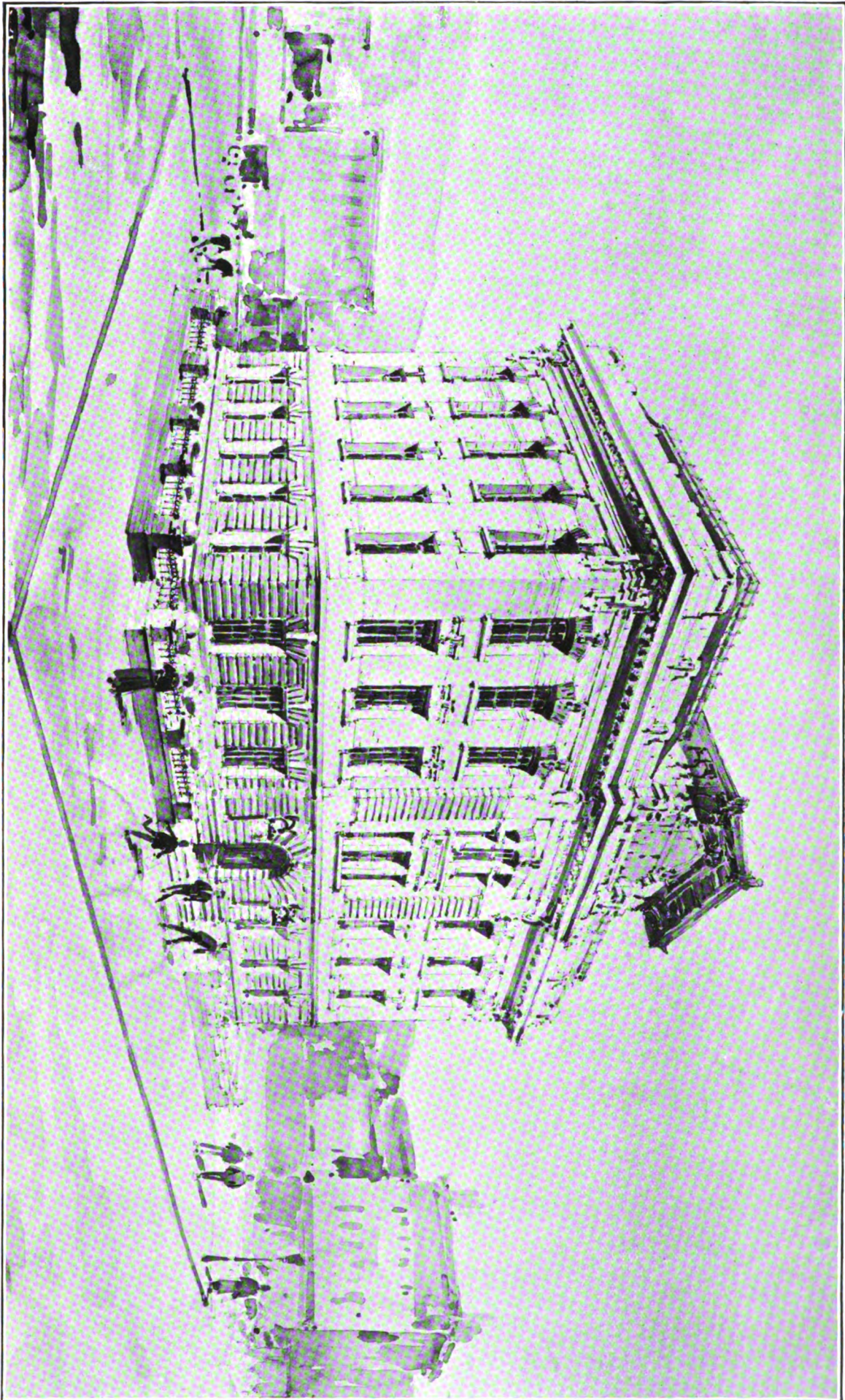


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DETENTION HOSPITAL.—J. H. FREEDLANDER, ARCHITECT.



METALWORK IX.—No. 112 WASHINGTON PLACE, NEW YORK, N. Y.

It is not always pleasant to think who and what have occupied the venerable hacks whose downy beds of ease and fringed upholstery have been in use for many generations, and in which whole families of microbes, with and without wings, have founded empires and sent forth colonies.

Speaking of hacks naturally suggests the paying for them, and he is a happy man who can pay the exact fare. Otherwise, in exchange for a large bill he is liable to get a handful of lucre so unmistakably filthy that, before putting it into a clean pocket he instinctively looks for a piece of paper to wrap around it, as if it were a sample of Peruvian guano or a piece of Limburger cheese. Not that the hackmen are the only or chiefest of sinners, in this respect; we are all guilty; the original sin is with the banks, who cannot, or will not, renew the dirty old paper.

Sidewalks are supposed to be made for the comfort and safety of pedestrians. When they are so covered with water and ice that they cannot be used without danger of wet feet and broken limbs, there is a question of public sanitation involved. Yet in many of our most aristocratic streets, all the water from the adjacent lawns, whether it comes down in the form of rain or snow, must flow across the walks before it reaches the gutter where it belongs. This is one of the inexcusable follies to which we are so much accustomed that we forget to protest. It is entirely unnecessary; it is idiotic.

I can find no evidence that regions adjacent to burial-grounds are unhealthy, but we cannot escape the fact that cemeteries, built, so to speak, in sand that rests on a bed of clay, are often an important part of the subterranean water-shed from which the water used for domestic supply is drawn. Just what lines these underground water-courses take, is known only to the wizards of the witchhazel wand, but there can be no doubt that the rain that falls on these quiet graves steadily finds its filtering way to the hidden sources of the wells that supply us with water.

And, finally, not because the list is exhausted; in fact, it is hardly begun, but to bring this chapter to a close, if, for the benefit of the public, milk and butter and meat are inspected and condemned if found wanting, and apothecaries are held responsible for the poisons they dispense, should not the men who take the lives of peaceful citizens in their drunken hands be deprived of all liquors, except such as simply impoverish and stupefy (that is to say, pure liquors), without producing the insanity of dangerous intoxication?

Just how many people are made sick, or die every year on account of any or all of these shortcomings, or whether anybody has sickened or died in any year, I will not undertake to say, but logic is logic and dirt is dirt; if we are not sick, we ought to be. It is easy to say, by way of consolation for our sins, that we have lived comfortably in the past, that our population increases, numerically, at the rate of ten or some other per cent, that we are as healthy as Philadelphia—which the most of our smaller cities are not, by the way, notwithstanding the Schuylkill—as New York, Chicago or Washington; all of which has nothing to do with the case. We have no shadow of right to say that a death-rate of from twenty to twenty-five per thousand every year, and that, mostly among children and from diseases that are considered preventable, is not vastly beyond what it should be. Moreover, the death-rate in any community is by no means a fair measure of the sanitary condition of those composing it. Theologians of the cheerful sort assure us that in this "vale of woe" we are foreordained to live at a poor, dying rate, but, if I may be permitted to intimate that anything can be more true than a theological dogma, this is far more true hygienically than it is theologically.

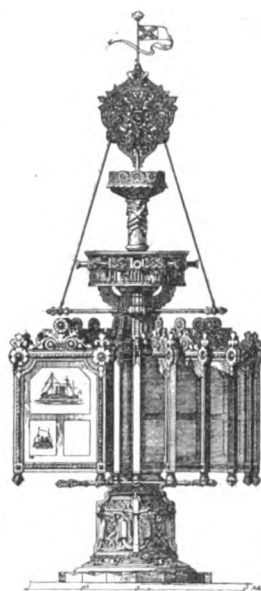
Why must we all, even in the best regulated families, have measles and mumps and whooping-cough? Why do nine-tenths of the adult population of New England have some form of catarrh? Why does biliousness brood over us like a yellow sunset, and malaria masquerade at all our evening entertainments? Is it wholly owing to the graceful mosquito? If so, why mosquitoes? Why is rheumatism in the blood and neuralgia in everything? Why do the majority of our militant women enlist under the most tyrannical of all officers, Gen. DeBility? How many of our wise men escape the tediousness of gradually approaching senility, instead of retaining full strength of body and mind, not to threescore and ten but to fourscore and ten? I am inclined to think that the tacit acceptance of the Hebraic allotment of years is a damaging suggestion to mankind, already handicapped by chronic precocity, and too much oppressed by a painful consciousness of the brevity of human life.

It goes without saying that people bring the most of their physical ills upon themselves by ignorance, greed and thoughtlessness; but making due allowance for this, there still remains a large contingent of sickness, discomfort, disease and death which may justly be ascribed to conditions for which neither the individual nor his heritage but the public in its corporate capacity is responsible.

E. C. GARDNER.

SWISS STEEL WORKS.—Switzerland has, up till now, not been noted as a centre for steel production, though her engineers have long held a high position in the mechanical world. Recently, however, a company has been formed to work the great deposits in the Bernese Oberland, where there are many million tons of ore available, averaging 50 per cent of iron. It is intended to attempt to smelt the metal electrically, the large water-power, cheaply obtainable, giving the plan a reasonable prospect of success.—*Engineering*.

THE IDEAL CITY.¹



Picture Show-case for the Russian Navy Department. From *Stroitel*.

THE object of my paper to-night is to try and precipitate, by means of discussion and suggestion, some conclusions as to what an ideal city should be, and also some agreement as to what a city should not contain that sets up any claims to be beautiful. What is it we want? We go up and down this city of London, for instance, open-eyed and open-mouthed, eager to observe and loud in our expressions of disapproval; but what do we want? What are our ideals? Abstract disapproval is so easy, and often so unhelpful—almost any one of us can condemn, but when bidden to specify alterations, difficulties—the difficulties, in fact—at once begin to appear. Are we agreed as to what we want? And by we I do not only mean architects, I mean amateurs of architecture, cultivated people, men of taste, those who have given thought to the matter, made their observations on other towns and digested them, county councillors, all those who have the care and the guardianship of this our city. What is it you want, and are you agreed upon it? What are your ideals?

We architects want to know. They are your ideals that are being carried out. Architecture, so far as it is living art, is the realization of the aims and needs of those that produce it, and the vernacular architecture of any given period is the index of the general feeling and temper of that age. The few sporadic attempts to do scholarly, antiquarian, or reactionary work have little influence on contemporary work, except where it happens to find itself in sympathy with those views; the great mass of building and construction generally is the true exponent of the popular view of architecture. Are you content? and, if so, why do you grumble? We talk of a city being beautiful, but we smile at the idea of making London so. Why? Even if, in these humble-minded days, that were too much to propose, could we not, if we wished, prevent its growing uglier? As it is, London gets more and more hideous every day. We never see an old house threatened with demolition but what we have to fear a loss in its successor; we never see a concerted design in architecture, such as some of our squares, a few streets like Stratford Place and others, but we know their harmony is soon to be disturbed, and that quality of unity got by gracious co-operation will be burst in upon and flung into the gutter. We have buildings we call masterpieces; can we not at least preserve them unharmed? We allow the appearance of Somerset House to be defaced by mean additions. We talk of alterations to Waterloo Bridge; Hawksmoor's Church is undermined by a railway station; the moment a monument comes in the way of what is called the "the convenience of the public," it is doomed and disappears.

Is it true, is it probable that we cannot have what we want? What is it stands in the way? It isn't money. We can afford to have our way. We hear ourselves described as an indomitable people, and we accept the epithet with complacency; it is not from want of saying that we know we are rich. We may not be an artistic people, but we are good organizers and governors, and such a standard of magnificence as Rome achieved might be ours, did we desire it. The trouble is that we are not agreed as to what we want, and we are not sure that we ought to want it. Directly we are all agreed upon some public matter an architecture springs up in response, and according to the quality of the sentiment so is its interest. The national conscience has for long been deeply stirred by the sight of helpless suffering, and the hospitals we have built to alleviate that and to increase our knowledge as to its prevention form one of the contributions of fine living architecture to the nineteenth century. So, too, are the great asylums. The care and thought, the quintessence of medical observation and research, have been gathered up and sublimed into formulated necessities, which have dominated the buildings erected in compliance, and by their insistence have given strength, and history, and interest to these structures.

Other contributions to the architecture of our time are our board schools, museums, public libraries and technical institutes, based also on a popular desire to improve the conditions of our life. Abate something of the virtue of the impulse, and the standard of interest in style of architecture falls immediately. The theatres, restaurants and gin-palaces all rise in response to the popular call, and the nobleness of the demand dictates, in proportion, the nobility of the architecture. But in these instances there is, broadly speaking, a general agreement and codification of our desires; it is not so as regards the general treatment of our city. What is the view one is to take of London? That it is a vast workaday centre, from which all who are fortunate enough flee, after the day's work is done, to a bed in

¹ A paper by Mr. Halsey Ricardo, read at the Congress of the Royal Institute of British Architects on Wednesday evening, June 20.

the country? If so, let us at once set about accentuating the position and importance of the railway stations, let us widen and straighten the routes between them, let us concentrate within a ring, if possible, the industrial nucleus, and separate the residential from it with an insulating zone of open space. We shall not make the city beautiful, it is true, but possibly we might its suburbs.

The day has gone by when the city was walled round for shelter and defence, and the great gates of old time have been replaced now by those huge vomitories — the railway termini. But the gates of the walled city were prominent features both from within and without; their purpose was unmistakable and resulted in characteristic form. Cannot we do as much for our railway-stations? Merely to clear away a wide space in front of them and to make the route spacious and direct would do much to give them distinction. Although I myself repudiate the idea of treating London as a mere workshop, still it is at least a definite treatment, a definite conception, and definition is what is at present so forcibly lacking in the handling of our city. The anxious, fevered scuttle from station to office, and from office back again to catch the train, is not a particularly fine idea, and is not likely to bring about particularly fine results; but poor as they would be, they would be preferable to the present welter and the sense of compromise got from adjusting small individual claims. Or shall we take the view of London that it is a place to be proud of, and that we mean to be proud of it and keep it as a source of pride? There are many things that would justify us in this attitude — the river and some of the bridges that span it, and the Embankment that confines it; the Abbey, the Cathedral, the many churches and public buildings, some few of our squares and streets — possibly our parks.

And what should we do? Well, I am talking of the ideal city, and I permit myself some flights of fancy that may be condemned as not altogether practical, though I try to keep on the hither side of Utopia, and so I answer, "Keep them." Keep our public buildings, keep our bridges, our squares and our streets (those that we are agreed upon as embellishments of our city), keep them as they stand, at least for the present. As they are the subjects of our pride, let us treat them so; let the access to them be obvious and direct. Take the river for example. Let it be embanked on both sides, and let us have occasional glimpses of it from the Strand, wider and less squalid than the few grudging peeps which we can with difficulty now get. We are incessantly increasing the span of its bridges to facilitate the water traffic; let us have a traffic that may be pleasant to the eye and handy to the passenger.

A swift service of small steamboats, trim and tidy, would help to relieve the congestion of our streets, and in many weathers and to many people would be a welcome alternative to the pavement. I said "trim and tidy," because on the grounds, seemingly, that we are rich and industrious, we can't afford to be clean and decent, and haven't the time to be bothered with the necessary trouble; so London is disgusting and smelly, owing to our slovenliness. The pride in a neat and perfect turn-out still clings to the stable, the harness-room, and the coach-house, and, by an association of ideas, somewhat affects the railway train; but the pavement is a fixed, interminable spittoon, and the tops of omnibuses a travelling one. In my ideal city, my impracticable Utopia, I would have a higher standard of cleanliness and scavenging. I would have more pageantry, more processions, and I would make many of them go by water. The Lord Mayor and his state-barges should be a familiar sight on the Thames. And I should like more music, especially on the water. The organ-grinder, the solo instrumentalist, "the German band," and all such small enterprise I would banish utterly from the streets, as well as yelling ruffians, street cries, and newspaper pitches; but in compensation I would increase the quantity of music already provided by the County Council, and I would provide a supply of kiosks in the streets where people could buy their papers in peace. We are surely all agreed that noise and disorder are ugly features in a city as well as in a house; and yet we permit great shouting letters, winking and glaring lights, every form of eye-torture that may sear itself indelibly on the brain — for the object of many of these advertisements is that you may never forget them again for the rest of your life. In the "ideal city" there would be a control over these street distractions, so as to secure some uniformity of effect. Nor should the streets preserve their haphazard character, so far as their general growth and expansion may give us chance for correction. The great streams of traffic should cross each other at right angles. The railway stations, the great creators of the swift-going traffic, should be recognized and their influence accepted, and the shortest direct routes to them taken in hand and developed to meet the case.

But life is not all a hurrying from one ant-hill to another; there is such a thing as leisure and the enjoyment of it; there is such a thing as work which may be done deliberately and in quiet. Let us preserve, then, the back-waters and retreats, where we can find them in London, and ensure that they shall not be arbitrarily invaded. They should be the shelters of our monuments. Each year we erect fresh statues in memory of famous men, but we have nowhere to put them, and they stand in the howling chaos of our streets, pitiable and helpless, horribly misplaced — or else they are thrust out of sight in narrow streets or chance corners. What a terrible misprision of their qualities, this argues! It is part of the same temper that treats a piece of sculpture, an obelisk or a fountain quite without reference to the site it has to occupy or its proper function, which

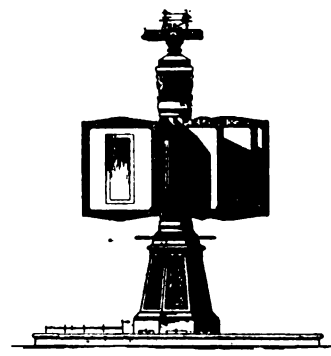
is to add to and accentuate the general architectonic character of the locality it is to adorn. Architecture and decorative and monumental sculpture are not, as it seems to be thought, matters merely of detail, and immaterial how they may be combined, having no necessary connection — architecture in our cities should be the expression of our ideas, the ideas of a community, our corporate, not our individual desires. The aspect of our streets concerns us all, and such individuality as there may be in it is pleasant to us, so far as it reflects the history of the locality and such human characteristics as are obviously gracious and kindly.

Lastly, there is the question of color in our ideal city — color, natural and artificial — both of great consequence as regards beauty and both requiring broad, concerted treatment. Natural color resolves itself into grass, trees, shrubs and flowers.

I will leave the parks as outside the province of my paper and consider the use of grass and foliage as it concerns our streets and open spaces. That much can be done by a mere strip of grass is shown by the breadth in front of the National Gallery. But why should we pause there? Why not compress to half their area the fountain-basins in Trafalgar Square and turf the square — introducing, during the summer months, a few formal-shaped trees in tubs or boxes, to give contrast and variety to the green? Then the trees in our streets. At present they are planted at the sides of our streets, in the pavements, and the contours of the trees chosen are incompatible with the position assigned. They cannot grow properly without interfering with the light and air of the adjacent houses. Trees, such as planes, with spreading foliage, should be planted in the centre of the streets, where they can flourish unutilized and be of service in dividing the traffic. Where practicable, our streets should open to disclose a vista of green, or a peep into the verdure of our squares or a glance on to the parterres of our Embankment. Of artificial color little has been tried, and that little, done in experimental, isolated ways, is worse than useless. Color must be treated broadly and in mass; in small quantities it is mainly irritating by its spottiness and the want of co-operation from the rest of its surroundings. Color, quite as much as any other quality of architecture, must be used to express not merely individual whim and fancy, but must symbolise some general purpose and inspiration. Consequently, if we are to have color in our streets, we must treat it heraldically. This has been recognized in some measure already, where color has been employed by bodies of men — such as the State, vestries, parish councils, railway and other companies. Here in London each parish colors its lamp-posts the parish colors — the dust and water carts carry the proper parochial bearings and legends; throughout Great Britain scarlet is the official tincture of the Post-office, black and white the traditional heraldry of the coast-guard stations. Our railway-trains and our omnibuses tell, by their color, the companies to which they belong and the routes they take. We have London already divided up into various divisions — electoral, parochial and the like. Let us take advantage of these and display those divisions outwardly to the eye. Already the parish lamp-posts and other obstacles are distinguished from each other by pattern and color; we might go farther and define the boundaries of the parish by the color of the area-railings, and some form of superposed tint or quartering in part might define the electoral divisions. Moreover, the vestry-hall and parish-library would gather up in concentrated form the accepted heraldry of their office and locality, making them landmarks in the neighborhood by the splendid richness of their color, containing in their accumulation the separate badges and symbols elsewhere distributed through the locality, and explaining in the sum of their achievements the various voices whose utterances form the chorus of civic life.

Many are the "ideal cities" that might be shadowed forth — but our first concern is to settle what is to be our attitude towards the city as at present. Are we here on sufferance only, or do we mean to reside in it, and consequently, make it worth residing in? This point settled, the conditions of our residence will help to formulate our ideal, and by organized co-operation we can work towards this end, and once clear in our minds what we want, we can push confidently towards the fulfilment.

THE ROLLS HOUSE AND CHAPEL, LONDON.



Picture Show-case for the Russian Navy Department. From *Stroitel*.

THE destruction of the Rolls Chapel a few months ago was one of the worst acts of vandalism that has been perpetrated for many years. The house, which was built in 1724 upon the site of a more ancient one erected as a home for converted Jews, was of little interest; but the remains of the chapel, which was originally founded in 1282, ought to have commanded some respect even from those who plan "improvements." The building had been patched and tinkered until little remained of the original edifice; but when the demolition was undertaken, several precious relics of the past were discovered, built up into newer walls or encased in

rubble and stucco. The chancel-arch had been filled-in and a square opening made in the centre of the rubble. The proportions of the arch were excellent, the mouldings, pure Early English, springing from what appear to be corbels upon flat jambs, but possibly the shafts have been destroyed. In a document dated 16 Jan., 1232, the king (Henry III) gave 700 marks to found a home for converts from Judaism, and for building a church and house; the health of his own soul and the souls of his ancestors and heirs being the motive power for the foundation. Money went farther in those days than in ours, for we find a few months later that the Treasurer of the Kingdom, the Bishop of Carlisle, was enjoined to support two chaplains out of the 700 marks, the said clerics not only being destined for the services of the church, but also, probably, to be managers of the house. We read that Walter, one of them, admitted converts and distributed to them their liveries. Matthew Paris's Chronicle says that the king founded a similar institution at Oxford; and on the margin of Matthew Paris's manuscript (at Corpus Christi College, Cambridge) there is a curious drawing of the Rolls Chapel, London, showing, by means of the draughtsman's curious perspective, both ends of the building in the same drawing.

In 1236 the king bestowed the Church of St. Dunstan, "near the New Temple," upon the House of Converts, this church and its fruits and profits having been given over to Henry by the Abbot and Convent of Westminster.

The Rolls Chapel and House were situated in Fetter Lane, now the site of the new Records Office, and the Church of St. Dunstan being in Fleet Street, at the corner of Chancery Lane, it may be assumed that the land between these two buildings was a part of the estate bestowed upon the Rolls House.

Men, women and children occupied the house, but they were allowed to pursue their work elsewhere. Thus two bowmen of the king's had their daily necessities found them at the Tower, that their work there might not be hindered by returning to their house. The number of converts in 1256 seems to have been large, as cloth for 150 robes was distributed before Christmas, and the next year cloth for 171 tunics for Easter and 164 for Pentecost was required.

It is curious to note that although the Jews were converted, they were still living under certain disabilities: all their goods and chattels were, wholly and by right and custom, the king's property; but being, in his own sight, good and just, he bestowed a moiety of the value of their entire possessions upon them for a period of seven years. If, however, the inmates earned money, it was arranged that their allowances should be withheld. The house also seems to have received the *chevage*, or poll-tax, levied on Jews — 3d a head in the reign of Edward I, there being then 1,179 Jews in all England. The number of converts in the house varied from time to time.

About the year 1529 the house became a court of law, and the "Master of the Rolls" was converted into a judge, a title which is still held by one of Her Majesty's judges. Thomas Cromwell, Henry VIII's henchman, held the post; and, earlier, one John Young seems to have been an important Master, for a beautiful monument by Torrigiano was erected to his memory. In 1538-9 a survey of the house was taken, which gives an account of as many as twelve "chambers," besides a parlor, hall (with painted cloth round it), kitchen and other offices. There was also a garden; but when this survey was taken there was only one inmate, and during the next twenty-six years masters, clerks and chaplains received their salaries for having the charge of an otherwise empty house. Then for a few years a few Jewish converts trickled into the house, most apparently, by their names, foreigners; but, under the Commonwealth, although the Jews returned to England, there is no account of the Masters of the Rolls receiving any converts into their ancient house. Petitions were frequently sent up, as time went on, for participation in the benefits of the Rolls House; but they were generally shelved, and either there were no converts or the law took the endowments to itself and gave doles in charity.

In 1708 the church must have been much rebuilt, for we read of "doors and windows of the Gothic order," a slate roof, and Ionic and composite columns in the interior. These "Gothic details" are the fragments of the thirteenth-century building which have lately been exposed to view, having been covered up by more modern work for a century and a half. That the chapel ought to have been preserved there can be no doubt; and it seems strange that antiquaries, archaeologists and the Society for the Preservation of Ancient Buildings could not have prevailed upon the authorities to preserve so interesting a relic of the past. There was a considerable outcry at the time of its destruction, but it ended in futile condemnations of the vandalism, and in the place of the old chapel we have seen modern buildings arise which are dedicated to utility, and the "Gothic doors and windows" are now as much memories of the past as the Jewish converts and their liveries.

Most of this account (and much more) upon the subject of the foundation for converted Jews is culled from an interesting little illustrated brochure by Mr. W. J. Hardy, F. S. A.; but as the "History of Rolls House and Chapel" is mainly historical rather than architectural, and the sort of history beloved of the antiquary, I refer readers to the original pamphlet published by F. E. Robinson, 20 Great Russell Street, London, at 1s. Some additional facts may be found in the "Report of the Deputy Keeper of Public Records" (Sir H. C. Maxwell Lyte), published by Eyre & Spottiswood, upon this most interesting subject of Jewish converts.

S. BEALE.

BOOKS AND PAPERS

IF the American draughtsman of to-day — the architect of to-morrow — is really a scoffer of "precedent," a scorner of things that have once been done, and well done, by someone else, publishers of architectural works will do well to heed the fact and no longer waste their money in manufacturing books they vainly imagine may be useful to the architectural student. But why use that last term when shortly there are to be no architectural students, since the schools are all wrong, their teaching being founded on precedent, and the teachers are unworthy of a following? The "indigenous" and the "inventive" have no need of books.

But if there be here and there one or two students or draughtsmen in whom a sense of modesty lingers they may like to have their attention drawn to a useful little hand-book¹; that is, it is useful to those who are willing to be somewhat guided by precedent in the development of their indigenous inventiveness. Like all hand-books, particularly when they are small ones, this of Mr. Glazier's is warranted not to have in it the exact representation of the bit of decorative detail which the draughtsman, at the end of his inventiveness, and doubtful whether he is a true *indigène*, at length shamefacedly decides to hunt for "in the books." But in this respect this hand-book is no more deficient than any other, as such publications very rarely contain the matter that is sought presented in just the manner in which one desires to use it. But they do contain precedents, principles, the essential features and characteristics of a style, data which can be used even by the most egotistical of *indigènes* without loss of self-respect.

A little book of 135 pages, of which 43 are occupied by full-page plates, while the remaining pages of text are liberally sprinkled with smaller cuts, does not give space for more than a very concise treatment of the history and characteristics of Egyptian, Greek, Roman, Byzantine, Gothic, Renaissance, Japanese and Indian ornament, to say nothing of similar discussions of mosaics, stained-glass, furniture, ceramics, metal-work, textiles, etc. But the illustrations are so abundant and so admirably presented, and the brief discussions are so lucid that the work forms an admirable school-book for the pupils of art-schools, and has a certain value for the architectural draughtsman as well.

ILLUSTRATIONS

[Contributors of drawings are requested to send also plans and a full and adequate description of the buildings, including a statement of cost.]

HUGUENOT LODGE CHAMBERS, NEW ROCHELLE, N. Y. MR. GEORGE KRAMER THOMPSON, ARCHITECT, NEW YORK, N. Y.

This building is just being started and is to be built of stone. The first floor is to be used for a library, and the second and third stories for lodge rooms.

DESIGN FOR A MONUMENT TO THE "Maine." MR. J. H. FREEDLANDER, ARCHITECT, NEW YORK, N. Y.

DETENTION HOSPITAL. MR. J. H. FREEDLANDER, ARCHITECT, NEW YORK, N. Y.

This plate was accidentally forgotten at the time of publishing the companion drawings in our issue for July 2, last.

SCRANTON MEMORIAL LIBRARY, MADISON, CONN. MESSRS. BRITE & BACON, ARCHITECTS, NEW YORK, N. Y.

METALWORK, — IX: ENTRANCE TO NO. 112 WASHINGTON PLACE, NEW YORK, N. Y.

[The following named illustrations may be found by reference to our advertising pages.]

STAIRCASES IN THE MAGASINS DUFAYEL, PARIS, FRANCE. M. RIVES, ARCHITECT.

This plate is copied from *La Construction Moderne*.

HOUSES AT WALTON-ON-THAMES AND WEYBRIDGE, ENG. MESSRS. NIVEN & WIGGLESWORTH, ARCHITECTS.

This plate is copied from the *Building News*.

¹ "A Manual of Historic Ornament," treating upon the Evolution, Tradition and Development of Architecture and other Applied Arts. Prepared for the Use of Students and Craftsmen. By Richard Glazier, A.R.I.B.A., Head Master of the Municipal School of Art, Manchester. With 470 Illustrations by the Author. New York: Charles Scribner's Sons. London: B. T. Batsford. 1900. Price, \$2.50.

[Additional Illustrations in the International Edition.]

ROMAN CATHOLIC CHAPEL, WEST POINT, N. Y. MESSRS. HEINS & LAFARGE, ARCHITECTS, NEW YORK, N. Y.

[Gelatine Print.]

HOUSE OF JULES S. BACHE, ESQ., NO. 8 EAST 67TH ST., NEW YORK, N. Y. MR. C. P. H. GILBERT, ARCHITECT, NEW YORK, N. Y.

[Gelatine Print.]

ENTRANCE TO THE CONSTABLE BUILDING, NO. 111 FIFTH AVK., NEW YORK, N. Y. MESSRS. WM. SCHICKEL & CO., ARCHITECTS, NEW YORK, N. Y.

[Gelatine Print.]

L. C. C. WEIGHTS AND MEASURES OFFICE, SHOREDITCH, LONDON, ENG.

SHOREDITCH FREE LIBRARY, HOXTON, LONDON, ENG. MR. H. T. HARE, ARCHITECT.

DINING-ROOM CHIMNEYPIECE: SHILLINGFORD HILL, BERKSHIRE, ENG. MR. GEORGE HORNBLLOWER, ARCHITECT.

CORRIDOR ON THE CHAMBER FLOOR: SHILLINGFORD HILL.



THE WEATHER BUREAU ON LIGHTNING.—In view of the presence of the cyclonic period of the year when thunderstorms are of almost daily occurrence a report prepared by Professor Henry, of the United States Weather Bureau, on the subject will be read with peculiar interest. It is unpleasant at the outset to note that the number of deaths from lightning stroke is increasing. For the year 1899 it was the largest on record. During the twelve months 562 persons were killed instantly, or received such injuries as speedily resulted in their death. In addition 820 received shock more or less severe, from which they ultimately recovered. Some of these recovery cases presented peculiar features. In several instances the clothing of the persons struck was set on fire and their bodies were badly burned, yet they ultimately experienced complete recovery. In some of the fatal cases there was no outward injury visible, while in others discoloration of the skin was observable all over the body. Some valuable hints are given in the report regarding the precautions that should be taken to avoid danger while a thunderstorm is in progress. Many housewives are partial to wire clotheslines, and insist in having them strung across their back yards. By so doing they not only subject the laundress to danger, but imperil any building to which the wires may be attached. Twelve persons were killed last year either in the act of stripping such lines or by coming in close proximity to the wires during the storm. Several fires were started through wire clotheslines being stretched between trees in the yard and the house. It is never wise to take shelter under a tree during a thunderstorm. About eleven per cent of all deaths that occurred last year were caused in that way. People in the house during a storm should keep away from the chimney and should not sit between open doors or by open windows. Riders should dismount from their horses and stand as far from them as possible during the storm. The greatest number of deaths from lightning in 1899 in any State of the Union was 56. These occurred in Pennsylvania. Illinois was second in the list of fatalities, 41 having been stricken here. Pennsylvania also was first in the number of injuries, 124 having happened in that State. New York was a close second in that respect, with a total of 103. Illinois had more people killed than injured. It also had the greatest increase in the number of fatal cases as compared with the previous year, though there was material increase in Pennsylvania, Ohio, North Carolina, Minnesota and Michigan. The States in which the greatest decreases occurred were Texas, New York and Alabama. No certain theory can be advanced to account for the increase or decrease of such cases. The lightning flieth where it listeth, and no man can tell where, when or why it is going to strike. It is questionable if the laws that govern its motion will ever be discovered. Investigation in this direction is considerably handicapped by the general reluctance to fool too much with the lightning buzz-saw. — *Chicago Evening Post*.

FOOTPRINT RECORDS OF VISITS.—On the roof of the tower of Goudhurst Church, in Kent, numerous outlines of men's and women's feet have been scratched on the lead. They are, for the most part, simply outlined by a plain line, but in a few instances by a narrow zigzag, such as would be produced by a brad-awl pushed forward, whose right and left edges cut alternately. The inside of the outlines is in some examples partly filled by a series of lines representing the metal toe and heel caps or other structural markings of the sole. Some of the outlines have names or initials only as well as the date added, which in two cases is 1823, while the latest instance seems to be 1884. The custom of recording a visit to a place by means of a foot outline seems to be very widespread; similar foot outlines may be seen in Egypt. There are several drawn on the sandstone pavement surrounding the small Temple of Amenhotep III, at El Kab, near Edfu; two or three were uncovered on one of the stones at the northeast gate of the town wall by Mr. Quibell in 1897-'98. I have observed other foot outlines on the top of a small sandstone hill in the country between the Nile and the town of Kosser. The Egyptian examples seem to be comparatively recent; at any rate, there is no evidence that they are of great antiquity

or belong to the ancient Egyptian period. The example at the northeast gate of El Kab affords no evidence as to its date. I forward these notes in the hope that other correspondents may be induced to give more information of a similar character, such as on the footprints of prophets and saints, and the legend that Mahomet's footprint may be seen on a stone in the mosque of Omar at Jerusalem, and that of his camel or donkey at Sinai. Notes on the models of footprints of Indian divinities in our museums would also be of interest. On the north side of the west door of Goudhurst Church are several deep scratches or cuts, as if tools had been sharpened upon the stones. Similar marks are found on all the ancient buildings in Egypt. They are attributed to the women, who consider that rubbing any building or object which is "kafry," or belonging to the "infidels," is a charm against sterility. Is the trace of any such idea to be found in our own folk-lore? — *Notes and Queries*.

THE ENGLISH COAL-SUPPLY.—A Board of Trade report, just issued in London, has once more caused an alarm to be sounded in certain quarters over the enormous and increasing amount of coal exported annually from the United Kingdom. The total exports amounted in 1899 to no less than 41,180,300 tons, or 6,121,870 more than in the previous year. The greatest amount goes to European ports, including those on the Mediterranean. Excluding the Channel Islands, Malta, and Cyprus, and certain points on the Asiatic and African shores, which absorb about a million tons, European countries take about thirty-six million tons, the export in 1899 exceeding that in the previous year by over five million five hundred and eighty-nine thousand tons. There is an increase in every direction but one, viz, Northern and Central America, where the falling off is about one hundred and fifty-seven thousand tons, the total quantity being less than a quarter of a million tons. Europe, in fact, accounts for nearly seven-eighths of the total exports, Brazil, Uruguay, and the Argentine States being the only other large customers, taking more than two and a quarter million tons. The question is how long the supply will meet the demand. Already in Lancashire, in more places than one, coal is worked at a depth of 2,700 feet, at a temperature over eighty degrees Fahr. The opinions of experts as to the quantity remaining vary tremendously. Some think there is enough for the next 1,200 years, others that it will be exhausted in three or four centuries. As the supply begins to shorten, prices, of course, will begin to rise, and expensive fuel means a great deal. But the experts may be mistaken or a substitute discovered. At all events there is no cause for present anxiety. — *N. Y. Evening Post*.

THE WALL OF PEKIN.—Writing on the city of Pekin, the London *Engineer* says the walls of the Tartar city are of an average height of 50 feet, but portions of the north wall reach the height of 61 feet. Their average width is about forty feet, but they have been built so irregularly that in places a width of 57 feet is found, in others a width of only 22 feet. The outer face of the wall is perpendicular, while its inner face slopes, in some places very considerably. Parapets are erected on both inner and outer faces of the wall, that on the latter being loopholed and crenellated. At intervals of about fifty or sixty yards are large buttresses, every sixth being of much larger size than the others; the smaller ones are about fifteen feet to twenty feet square. Part of the inner brick lining having fallen away from the north wall, an opportunity was afforded of observing its construction. Near the gates the walls are occasionally faced with stone, but in other parts by immense bricks which bear a strong resemblance to stone. The space between the facings is filled up, first by a solid foundation of concrete of some ten feet in depth, then by a layer of well-rammed earth; another layer of concrete and another of earth succeed, the latter being paved with large blocks of granite, which form the *terre-plein*. The earth to fill-in the wall was taken from the ditch which surrounds the city. The concrete resisted all the efforts of our sappers to form a trench on the *terreplein* during the last war. Each of the gates has a buttress on either side connected with a semi-circular wall, which thus forms an *enceinte*. That of the central south gates is larger than any of the others, and is the only one with three entrances—the central gate being for the use of the Emperor or his family alone. The arches of the gateways are well built.

AMERICAN ART-STUDENTS AS PARIS GUIDES.—Paris is full of American art-students, who are endeavoring to get an art education. Many of them find it a hard struggle to make both ends meet, and they intend using the opportunities the Exposition offers to add to their meagre bank-accounts. They are organized into a bureau of companion guides, and the enterprise is conducted in a businesslike, systematic manner. Miss Nina Estabrook, of Chicago, has the work in hand, and it is said that she has the support of the American Consul-General, Commissioner-General Peck, Mrs. Potter Palmer and many others. These young women, knowing Paris so thoroughly, are of great assistance to women visiting the Exposition. They are bright, companionable, full of knowledge as to the best places to dine or lunch, and the cheapest ways to get from point to point. They know the anecdotes, traditions, histories of all the important places in the city. They all speak English and French, and are naturally superior in many ways to the professional Parisian guides. — *Chicago Times-Herald*.

DANGER FROM THE INCANDESCENT-LAMP.—The record in the demonstration of what heat an incandescent-lamp is capable of throwing out is broken in a photograph, lately published, of a wooden partition through which a large hole had been burned simply by the pressure upon it laterally of an incandescent lamp. Some mechanics who were at work in the room wanted the light closer, and twisted the flexible cord around a nail in a freshly finished wooden partition. The lamp, with its bulb resting on the wall, was left burning when the workmen left at 5 p. m. When they came back to work at 7 o'clock next morning the lamp had burned a hole larger than itself through the wainscoting, and was hanging clear of contact with the charred wood, which had, fortunately, burned itself out. — *London Express*.

Entered at the Post-Office at Boston as second-class matter.

AUGUST 4, 1900.



SUMMARY:—

The Defective Eyesight of School-children and its Causes.—Regular Examination of School-children by Oculists.—Use of a Naphtha Torch causes the Destruction of a Church.—Shade-trees vs. Electric Wires.—Interesting Discovery of Communal Buildings in New Mexico.—The National Academy of Design's new Classes in Metallurgy.—Silver and Bronze Medals not acceptable to some Artists.—A Correction.	33
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THE three hundred and fifty-one children attending one of the Jersey City public schools have recently had their eyes examined by a competent oculist, at the order of the School Board, and he reports that only sixty-nine of the number possess perfect eyesight. The statement is not a little startling, as the percentage of imperfection is very high, and those who read hastily probably feel that, as the defects are found in school-children, the cause of the defects must lie in the improper lighting of the school-rooms, and that the architect who designed the building is responsible for a physical infliction of very grievous nature. But it is not fair to make such a deduction, and, more than this, we do not feel that the diseases and weaknesses of the eyes that afflict school-children, defects that statistics show to be on the increase, are in the major degree chargeable to the improper lighting of school-rooms, although it is the custom to make that charge as the easiest way of disposing of the matter. As to the large number of children in the Jersey City school reported as having eyesight defective at the time of the examination, it must be remembered that the eye, like other portions of the body, is subject to temporary ailments, and so an examination made a few weeks later would doubtless reveal that many natural cures had been effected meanwhile. School-children occupy school-rooms only some five or six hours a day, and during the morning session, at least, their physical condition is better than at any other time in the day, and so not likely to be much affected by improper lighting of the school-room. Moreover, scholars are occupied in recitation, during which the eye has chance of rest, from one-third to four-fifths of the entire time spent within the school-building, and it seems to us a gross absurdity to assert that the short period of actual study in the school-room, however poorly that may be lighted, is the cause, or even a chief cause, of the trouble. Statistics show that ocular defects are on the increase, and it would be interesting to know whether the ratio remains the same in the buildings which have been in use for a term of years, or whether the ratio increases while conditions of lighting, good or bad, have remained unchanged. The fact that eyesight is deteriorating, while, as every one knows, greater effort is made to secure the proper lighting of school-rooms than ever before, tends to show that something other than the school-room is at fault. The other probable causes are the typographical imperfections of the school-books used, the enlargement in the educational curriculum, which entails longer hours of study, but most of all, the improper attitudes which children are allowed to assume at home while reading and studying, and the lack of care and watchfulness on the part of parents to provide proper light for the inevitable evening tasks, tasks which have to be disposed of while the eye is tired and strained. Our own parental ex-

perience satisfies us that school-book publishers and the improper conditions for study at home are more clearly responsible for weak and defective eyes than the imperfections of the school-rooms and the lack of watchfulness on the part of school-teachers.

BUT as publishers will use worn stereotype-plates, and as it is not to be expected that parents of all classes, living in houses and tenements of every grade, can provide perfect conditions for home study or understand how necessary it is to make sure that a child holds the book in a proper light and at a proper distance from the eye, a School Board can do no more sensible thing than place the school-children under the regular inspection of competent oculists. Mr. Gerhard, in the paper we published a week or two ago, establishes a very good case in favor of the introduction of the rain-bath into the school-houses established in localities which serve only the families of the tenement-dweller, and shows clearly how a physical cleanliness cannot but make more simple the task of keeping the atmosphere of a school-room sweet and clean. The medical examination of school-children which is enforced in Boston and in some of the schools in New York and Chicago has already proved its great usefulness in preventing the spread of contagious disease, and the installation of an inspecting oculist is but another step in the same direction. If architects should be called on to provide buildings for only physically clean and healthy children, we fancy they would be less often charged with being ignorant of how to light and ventilate a school-room.

IT is doubtful whether the plumber, the painter or the roofer is responsible for a greater fire-loss during a year one than the other, but between them their carelessness causes an immense loss, through the agency of the forgotten candle, the oily rag and the overturned brazier. The painter probably heads the list of delinquents, since to the peril of the oily rag he adds that of the naphtha-torch, though fortunately the practice of burning off paint has given way somewhat to the practice of dissolving it off with strong solvents. The torch, however, caused last week a rather unusual and interesting fire, the one that destroyed the Baptist church at Arlington, Mass. We call it unusual, for it seems to us a rather unnecessary piece of thoroughness to remove old paint from a church spire with a naphtha torch preparatory to giving it "three strong coats" of new paint. The case is interesting for several reasons. The trustee who authorized the painters to use the torch seems to have had a feeling that the process was hazardous, and it was his purpose to be personally on the scene with a Babcock fire-extinguisher for use in case of mishap; but, most unfortunately, he forgot to put in an appearance, and so there was no carbonic dioxide at hand to turn upon the first flame, which did not delay in getting firm possession of the spire, thoroughly dried by the recent intense heat. In the next place, although the authorities seem to have secured from the insurance companies a builder's permit which allowed them to make the proposed repairs without vitiating their insurance, the permit had run out before the spire was ready for painting, and no steps had been taken to secure an extension of it. In the last place, the insurance-policies contain the usual clauses prohibiting the use of naphtha on the insured premises. Altogether it looks as if the Baptist Society would lose not only its church edifice but also the seventeen thousand dollars for which it was insured, and, seeing how things have resulted, must now feel that it would have been cheaper to strip off the old clapboards and build a new spire, if their painters were unwilling to get rid of the old paint with scrapers and sand-paper. It seems possible that, in such cases as this, where a good deal of old paint is to be got rid of, the pneumatic sand-blast might be used to advantage.

THE matter of shade-trees is one that at this season always attracts attention, and in behalf of those which are suffering through the drought it is worth while to explain how a Toledo, O., man helps his trees to maintain a vigorous leafage. Having, by the use of a post-hole auger, discovered in what directions the main roots run, he sinks over them a length or two of drain-tile sunk vertically, the upper ends coming to within an inch or two of the sod, which can easily be made to drain into them, so that in case of natural rain or hose-watering the roots receive from a short shower or slight artificial

sprinkling a greater benefit than would be natural if the water fell upon an unprepared surface. But shade-trees do not suffer alone from drought and insects. It is said that they are injuriously affected by the passage of the electric-fluid over wires and cables that may be strung through or beside their branches, and as proof of this fact the manner in which the trees on Third Avenue, Brooklyn, have been destroyed by the feed-wire of the Third Avenue trolley-line is adduced. That the electric-fluid, in a more dilute form than a lightning-stroke, is injurious to trees we do not of our own knowledge care to assert, but it is perhaps likely. But, whether this be true or not, the electric-current is certainly the indirect cause of great havoc to our shade-trees at the hands of telephone, railway and telegraph line-men, and the citizens of the town as well as the aggrieved individual abutter have a right to protest that their rights are being trampled on by monopolies. Apparently the lawmakers of different communities look on the matter in different ways. Thus, in New York line-men are not allowed to cut down or trim shade-trees while stringing their wires unless they can prove that in undertaking to avoid them they would be obliged to resort to extreme or extraordinary means. In Michigan, on the other hand, the Supreme Court holds that the grant of a right to erect telegraph-poles along the highway implies, of course, the right to string wires on them and that wires cannot be strung if obstacles are interposed; that as the poles cannot be set in the road-bed and must be set within the curb-line, their natural place under the grant of location is in the same line as the boles of the shade-trees, and it is only so much the worse for the lovers of shade-trees if these and their branches are found to be obstacles. One would like to sentence that honorable court to spend the heated hours of the day for a few summers in driving a loaded team over a road running east and west and sheltered from the sun only by telegraph poles and wires.

THE ease and comfort with which life is sustained in the Klondike region and in Alaska is one of several facts that go to support the theory that some at least of what we are pleased to consider the aboriginal peoples of this continent in reality migrated from Asia, crossing Behring Strait by aid of a Mosaic miracle, perhaps, by boats, or over the ice. As all sorts and conditions of men are seeking their fortunes in the Klondike and, not finding them, are compelled to return afoot along the coast by the easiest trails, it is possible that some one of them, trained in ethnological research, may, during his tramp, light upon traces of the passage of the progenitors of the Mayas of Yucatan, and so show how this people of strongly Asiatic type arrived on this continent. For the ethnologist it is fortunate that the early peoples did not carry their food packed in the ubiquitous "tin" which now so untidily discloses the route of the modern emigrant, soldier or picnicker. But while the Maya riddle awaits solution, a good many enigmas of less age are being unriddled by the patient investigations of trained explorers; indeed there is every evidence that American archæology is attaining a rank of very considerable worth. Probably it can never reach the plane occupied by Egyptian and East Indian research, but it can no longer be sneered at as unfruitful and uninteresting, as used to be the case. One of the latest results achieved by American explorers is in the region of the Pajarito Cañon, between Bland and Española, New Mexico, where a party of explorers have discovered amidst "hundreds of similar ruins," the remains of a communal building, two or three stories high, built of dressed stone, measuring four hundred and fifty by five hundred feet and containing originally twelve or fifteen hundred rooms. Only one of these rooms was explored and the relics obtained are said to have been forwarded to the Northwestern University, at Evanston, Ill. If the report is true in all particulars, the finds are of great importance and, as the age of the ruins is placed at between five and six hundred years, they will compel the reconstruction of a good many theories regarding the civilization of the elder inhabitants of this country. In this one room, only nine feet by twelve, were found not only stone implements, battle-axes, polished stone mirrors and so on, but also iron knives and an iron bar, much rusted, of course, a rude smelting-furnace, copper ore and some gold ornaments, besides a beautiful turquoise. The fact that the clay pots about the hearth still contained bones and traces of food, such as scorched corn, together with other evidence, seems to indicate that the place was hastily deserted. The pottery, of which twenty-five samples were secured, was decorated on the inside surface as

well as outside, and some wicker baskets which could not endure handling are said to have had marked interest because of their form and the patterns developed in their weaving.

IN sending out the programme for the various classes of its Schools now housed at One-hundred-and-ninth Street and Amsterdam Avenue, New York, the National Academy of Design announces the establishment of a new department, in which the arts of die-sinking and the designing of coins and medals are to be taught under the united auspices of the American Numismatic and Archæological Society and the Academy of Design. Now, although the currency of the country is once more on a metallic basis and the industry of the counterfeiting brotherhood may make it necessary to call in and re-coin our circulating medium more frequently than in the past, we cannot believe that very many artists can make a livelihood by becoming expert in producing dies for use in the Government mints, all the more that the Director of the Mint has always shown a marked preference for adopting the designs prepared by the official designers. But there is on the other hand a very promising career for those who can produce artistic designs for the medals which are growing in favor as prizes to be distributed by learned, artistic, philanthropic and other bodies which stimulate emulation and promote progress in many directions by the inauguration of competitive contests of one kind or another. Moreover, even if a student cannot turn his training to account as a working die-sinker or medallist, he would find it of help in the studio attached to some of the great industries which are earning an enviable reputation for American silverware.

THAT portion of the public that has not the great good fortune to be included in one or another class of artists has always drawn amusement from the exhibitions of peevish self-complacency which so many artists—be they painters, sculptors, architects or photographers—seem to take pride and pleasure in exhibiting. Whistler's exhibitions of caustic ill-temper may be forgiven, since they generally have some shadow of an excuse, and are, moreover, so very amusing: besides one cannot help feeling at times that, like the antics of the mountebank, they have their real purpose as a means of advertising the artist and his product, and one is interested to discover how far the artist really dares to follow the fakir. There is never any means of telling when this foible of the artistic temperament will next break out, but its latest manifestation, so far as reported, is to be found in the published list of prizes—gold, silver and bronze medals and honorable mentions—awarded to artists exhibiting at the Paris Exposition. Appended to the list of recipients is a remark to the effect that the absence from the list of certain names, which might naturally be supposed would have been included in one grade or another, is to be accounted for by the fact that these unnamed artists "informed the jury that they would not accept silver or bronze medals." Could peevish self-complacency go farther! The artist, in the lordly way of his kind, seems to say to the jury to whose discriminating judgment he had voluntarily submitted his product, "I have weighed and measured myself and the value can be expressed only in gold." This manifestation of conceit would have been merely amusing if this statement had been made as a condition of acceptance at the time the exhibits were placed before the jury of admission, but it is said that the refusal—perhaps after all a quite uncalled-for one—was announced to the jury after the posting of the list of gold-medallists.

BEING modest persons, not given to placing undue value on the statements we make, we are, perhaps, too prone to feel the uselessness of correcting any immaterial blunder we may, from time to time, be guilty of, but we trust we have always shown a becoming willingness to correct any material misstatement likely to be of real prejudice to any one. There appear to be those, however, who flatteringly give an unexpected weight to our smallest saying and feel that even immaterial blunders should not go uncorrected. This agreeable flattery is to be found in the very opening paragraph of Number One, Volume First, of the *Architect and Builder*, a new architectural journal published in Philadelphia, where the editor points out that we accidentally did wrong to the memory of Leigh Hunt by ascribing to the late Clarence Cook the authorship of the verses dedicated to Abou Ben Adhem. We trust that in the long and prosperous career before him our contemporary may not find his pages sullied by a more direful blunder.

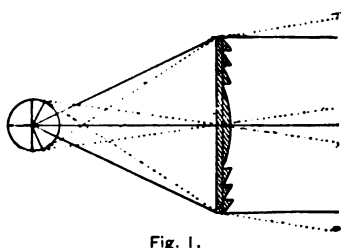
PRISMATIC LIGHTING FOR THE ILLUMINATION OF DARK INTERIORS.¹

Fig. 1.

fications, is to-day solely used for this purpose.

The Fresnel lens is designed for projecting a powerful beam of parallel light upon objects to be illuminated at a distance. The principle of this device is seen in Figure 1, which shows a central plano-convex lens surrounded by a series of rings or segments of lenses or prisms, to which successively diminishing curvatures or angles are given, in order to give them a common focus.

Within the past four or five years the application of this principle has been made, and with decided success, to the illumination of dark interior spaces, where the amount of light naturally entering therein is insufficient for satisfactory illumination, and artificial lighting must occasionally or constantly be resorted to.

The requirements of public buildings and modern office-buildings, in this respect, have been most urgent, and the various devices known generally by the name of "prismatic lights" have been extensively used for the purpose and have proved so useful that in one or another form they have come to be regarded by architects and builders, not to speak of a great number of householders, as indispensable.

It is the purpose of this communication to give a brief review of the art of prismatic lighting, which, at the present time, is passing through the active stages of the course of evolution, to which all the arts are subject, in determining the survival of the fittest.

Omitting, for the present, consideration of the vault-light for basements and cellars, where but one form of prism, namely, an approximately right-angled prism depending on total reflection for its utility, is admissible, there are two general methods in vogue of installing prismatic lights to meet the requirements of service.

In one of these, the sheet of prismatic glass is placed in a window-frame in the vertical position, thus taking the place of the window-light. In the other, the sheet of prismatic glass is installed in a more or less inclined position, projecting outwards from the window-opening. This form of construction is known in the trade as a "canopy."

The question as to which of these two forms of installation will give the best results is determined by the extent of the sky-opening upon which dependence must be placed for light.

Where this is of considerable area, as, for example, where the windows face a wide street, the prismatic glass set into the window-frames in the vertical position will give satisfactory results.

Where the windows receive their light from a restricted area, as, for example, in courtyards or the side-yards of dwelling-houses, and generally in the many situations where high walls rising in close proximity cut off the free access of light from above, the projecting canopy, form of prismatic glass is preferable.

Speaking in a general way, the change from the vertical to the canopy form of installation will be indicated when the incident angle of the light falling on the window-opening averages 60 degrees from the horizontal plane.

THE practical application of the refractive property of the lens or prism to change the direction of light-rays passing through it, for the purpose of artificial illumination, originated with the French physicist, Fresnel, who first suggested its use in lighthouses, for the protection of maritime coasts, about the year 1815; and the Fresnel lens, in various modifi-

The popularity achieved by the use of light-projecting devices of this general nature has called into existence a great number of patented inventions, some claiming special forms of prism-construction (in combination, in certain cases, with a prismatic or lenticular formation on the reverse side of the glass), and of a far greater number of design-patents and methods of glazing, and other matters of minor detail.

For the purpose of this communication, these minor devices may be left out of consideration, and the several generic forms of prism-construction only will be given attention.

These may be divided into two general classes:

(1) Those in which the glass forming the light-projecting device consists of sheets having on one surface a series of prisms or segments of lenses of any desired angle, the back of the sheet being a plane surface, and

(2) Those in which the glass forming the light-projecting device consists of sheets having on both surfaces a series of prisms or lenses.

The prism-glass most generally known and used is that of the first-named class.

The action of a section of prism-glass of this construction is shown in Figure 2, in elevation and plan. It is obvious that the general refracting effect of the prismatic surface in this and in the other forms of prism-glass will be substantially the same, whether the refractive surfaces of the structure be straight (i. e., prismatic), or more or less curved (i. e., lenticular), irrespective of the angles of the prism-sections or of the curvature of the lens-segments. It is important, however, that these angles (or curves) be carefully considered, since upon the correct appreciation of this element the light-projecting efficiency of the structure largely depends. Improper angles (or curvatures) may greatly diminish the efficiency of the device, by the dispersion and loss of light, caused by total reflections in the interior of the glass.

There is general misapprehension regarding the proper action of light-projecting glass, which needs a word of reference. It is assumed by many that the prismatic light should be so constructed that all the exterior light transmitted from the interior boundary of the prismatic window, or canopy, should be directed in lines substantially parallel to the boundary-walls, floor and ceiling of the apartment, and that the more nearly this condition is realized the closer will be the approach to the theoretically-perfect mode of operation. Some of the manufacturers of prismatic glass endeavor to realize this condition by varying the angles of the prisms uniformly from the centre to the edges of the sheets, on the principle of the Fresnel lens.

A little consideration of what is intended to be realized by prism-lighting of interiors will suffice to show that this view is an erroneous one and liable to result, in practice, in a much inferior interior illumination than can be otherwise obtained.

This criticism will be understood by stating the general proposition, that the objects of prismatic lighting are, first, to direct as much extraneous light into the interior as possible, and, second, to direct it in such manner as to derive the largest possible benefit therefrom.

In considering the relative merits of parallel and divergent light-transmission by prismatic glass, it should be said that

practically as much extraneous light can be directed into the interior space to be illuminated by the one as by the other arrangement of prisms or lenses. But, when we come to consider the second portion of the proposition, it can easily be shown that the system of transmitting the light in parallel lines cannot possibly be as effective as the method of divergent transmission, and more especially, divergent transmission in both vertical and horizontal planes, and for the following reason:

It is well known that the best effects in interior illumination are realized when uniform diffusion throughout the apartment is obtained. This effect can be secured most effectively only when all shadows are obliterated by calling into requisition the action of the entering

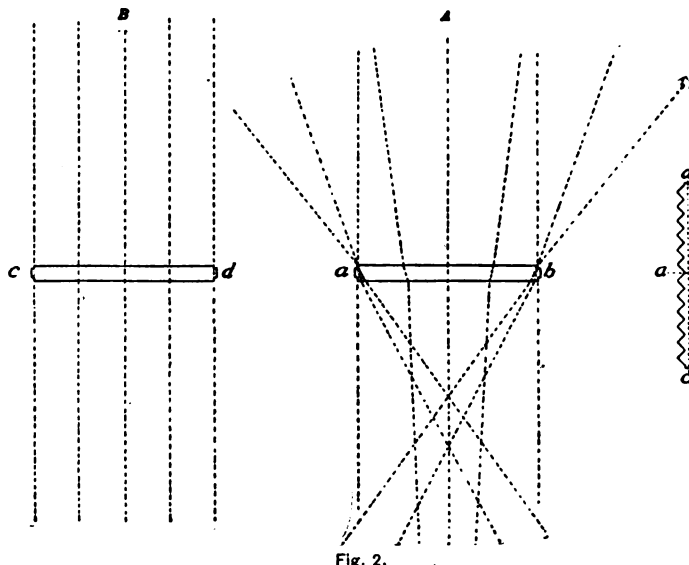


Fig. 2.

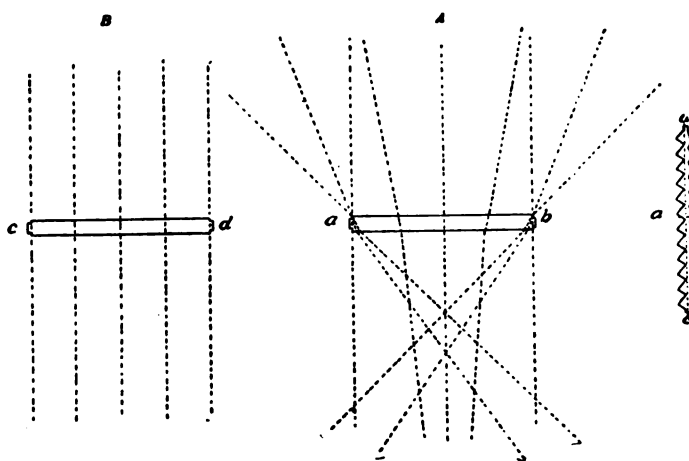


Fig. 3.

¹ Paper read by Dr. Wm. H. Greene, before the Franklin Institute, and printed in the *Journal of the Society*.

light reflected from all parts of the side-walls, floor and ceiling of the apartment.

By the method of directing the transmitted light in parallel lines, the ill effects of shadows cast by opaque objects in the path of the entering light will be realized in the extremest degree, as there will be no ameliorating influence to counteract and neutralize the shadows by reflection from the bounding-walls and floor of the apartment; and an inspection of the condition of an apartment thus treated will disclose this objection at once.

By the method of divergent transmission, while quite as much, or more, extraneous light is thrown into the apartment as by the other method, its distribution is decidedly more advantageous, from the fact that the repeated reflections from the bounding-surfaces of the apartment cause the practical obliteration of all shadows and a practically uniform diffusion of the light to all parts of the interior.

Returning now to the descriptive portion of the subject, the *modus*

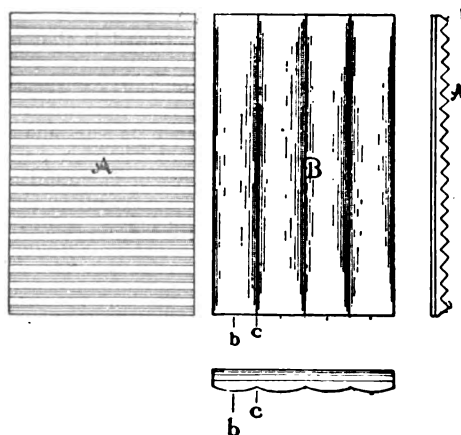


Fig. 4.

operandi of the simplest form of a light-projecting prismatic window is shown in the plan-views in Figure 2, A and B, in which the light from an exterior source falling upon the plane, outward surface of the glass is refracted at the boundary of the interior prismatic surfaces and projected into the room to be illuminated.

Figure 2 A, which is a plan-view of this construction taken on the line *a b*, exhibits the effect of the light-distribution in vertical plane from the effect of refraction from the terminal portions of the prism, where the influence of the more oblique rays is not counteracted by a modification of the angles of the prism from the centre-line to the upper and lower edges of the glass. Figure 2 B is a plan on line *c d*, showing that the light-rays are not distributed divergently in the horizontal plane, but are all directed in parallel lines.

Figures 3 and 4 represent the action of prismatic glass of the second class, i. e., in which both surfaces are prismatic or lenticular.

Figure 3 shows a form of light-projecting glass that has lately come into use, and for which certain advantages are claimed over the construction previously described. The sheets in this form of prism-glass have one surface furnished with prisms—commonly placed toward the room to be lighted—and the other surface formed of a series of lenses of small curvature, distributed in panel form, parallel to the direction of the prisms. This construction, as well as that shown in Figure 2, manifestly exaggerates in the vertical plane the divergent distribution of the transmitted light, and consequently operates, so far as it goes, in the correct manner, utilizing the reflecting action of ceiling and floor in diffusing the light.

The construction shown in Figure 3 possesses one obvious advantage over the several modifications of Class 1, namely, that the lenticular form of exterior surface arrests and directs into the dark interior to be lighted a certain amount of the exterior light, which, with the plane exterior surface of Class 1, would be lost by total reflection from the exterior plane surface. Practically, all of this additional light thus projected into the dark interior would be gained if the angle of the prism and the curvature of the lens-panels were correctly adapted to the length of the apartment to be lighted.

The latest modification of Class 2 remains yet to be considered.

In this, the interior prismatic surface of the glass is the same as that just described, but the exterior lenticular panels are arranged not parallel, but transversely, to the direction of the prisms. The details of this form of construction are shown in Figure 4, A and B, while the *modus operandi* is best observed in Figure 5, A and B.

The radical difference in the operation of this form of light-projecting glass and that of both forms previously described resides in the fact that the light-distribution in this form is exaggerated in the lateral as well as in the vertical plane. This feature is illustrated in Figure 5 B, in which B is supposed to be a section of the prismatic glass taken on the line *c d*, from an inspection of which it will be manifest that the vertical arrangement of the exterior lenticular panels will serve a similar purpose in this construction in relation to the light falling sidewise on the exterior surface of the glass as the lenticular panels in the previous case serve in relation to vertical rays; namely, to arrest and refract into the dark interior a considerable amount of light in the horizontal plane, which would otherwise be lost for useful purposes. All of the light thus collected and in-

duced into the dark interior by the lateral collecting action of this device is so much clear gain over the devices previously described.

Further consideration will show, also, that if the interior surface of the glass be provided with prisms of uniform angle, determined in each case by the length of the apartment to be illuminated, this form of construction will secure the same advantage in respect of the vertical diffusion of the entering light as will be obtained from the lenticular prismatic construction previously described.

On theoretical grounds, therefore, the last-described modification of light-projecting glass, belonging to Class 2, should give the best results if intelligently installed. Comparative practical tests also bear out this conclusion.

An additional and important advantage possessed by prism-glass of the last-named construction (namely, a prism-plate constructed with prisms on one side and prisms or lens-panels arranged transversely on the reverse side) remains to be noticed.

Since all illumination by means of prism-glass is thrown from a

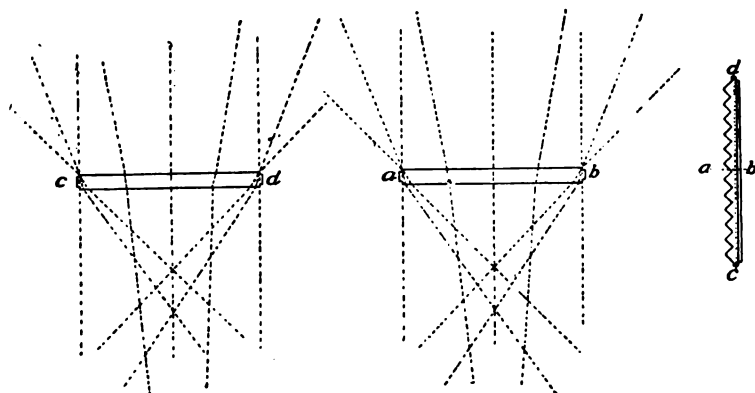


Fig. 5.

comparatively low point, namely, through windows, while all other artificial illumination is directed from a point above, the shadows produced by the prisms on objects in a room constitute a disadvantage common to most systems of lighting by means of prisms, as has been noticed in what has preceded. The light-projecting glass last described, however, by reason of its diffusing quality, both in the horizontal and vertical planes, largely overcomes this objection. Where two such prism-windows are used for the same apartment, the light thrown from one window completely overlaps that thrown from the other, thereby practically obliterating the shadows produced by prism-lights of other constructions.

This construction also has the advantage of enabling manufacturers to produce more readily the larger sizes of prisms, from the fact that one surface has projections at right angles to projections on the reverse side, giving a bridge effect, thus adding to the strength of the plate. For this reason, likewise, it is not essential to have the thickness of the body of the glass as great as with other forms; and, inasmuch as there is a larger loss of light, through absorption in passing through a thick than a thin medium, the loss of light from this cause may be very much reduced.

Finally, it may be said that all the various forms of light-projecting prismatic glass accomplish, measurably, their intended purpose of considerably increasing the illumination of dark interiors over what would occur without artificial aid. In the selection of the kind of light-projecting glass and the manner of its installation, the user should be guided by the personal observation of the effects produced, rather than by the claims of rival manufacturers.

THE CHANGES OF THE GREAT LAKE LEVELS.



Picture Show-case for the Russian Navy Department. From *Stroitel*.

AMONG old sailors and engineers who have studied Lake Michigan for fifty years, Captain Keith's "discovery" that the drainage-canal has lowered the lake level 5 inches does not produce much consternation. Lake Michigan, like all of the Great Lakes, is a mystery. Old seamen recall the fact that Lake Michigan once rose up bodily 7 feet in an hour along this coast. In 1886 it fell 3 feet in two hours. There was a great tidal wave in Lake Erie in 1843 at Buffalo, which drowned twenty people in their beds.

So strange and unaccountable are the fluctuations in the levels of all the Great Lakes that sailors have an abiding faith in "Old Sub," the underground monster, who turns the water off and on in a subterranean passage under the lake.

"Old Sub's tinkerin' with the stopcocks," say the seamen, when the water begins to creep up on the gauge. Sometimes the level goes lower and lower, and then the talk is that "Old Sub has taken to drink."

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THE BRIDGE "TRUSTS."

It is well for fair-minded people, and most people desire to be reasonable in their views of public affairs, to consider what may properly be said in favor of any combination of the kind commonly denominated as trusts. Not all of these great combinations that have been formed during the past two years are mere stock-watering schemes, although many of them, it must be admitted, are. The American Bridge Company, recently formed, is an instance of a combination for which some very good reasons are presented.

This combination was not formed hurriedly. It was a long time under consideration. The concerns which have entered it were not weak or unsuccessful, nor were they owned by men who were anxious to sell out their interests and retire from business. It was not a case where over-production had glutted the market. The construction of steel bridges and buildings is not a business which can be carried on like a nail-factory or a cotton-mill, that may accumulate a large stock of manufactured articles for which there is no immediate sale.

In the work of the bridge companies the contract must in every case precede the beginning of work upon any structure, and in almost every case an open competition is invited by the person or corporation which seeks to provide itself with such a piece of construction. Let us see what has happened in such cases hitherto.

The building of the East Hartford bridge across the Connecticut is a useful instance. In that case there were a dozen or more bidders, each one of whom submitted plans for the bridge which it proposed to supply, and each of these sets of plans cost several hundred dollars. Then each bidder was required to deposit a certified check of a specified amount, to be held until the competition was completed. In this way more than \$200,000 of cash capital was locked up for several weeks. It is probable that the actual cost of this competition to the bridge companies was not less than \$25,000. Practically the whole actual cost of the bridge was equalled by the amount expended by the companies seeking the contract. The same thing happens whenever a large number of bidders enter into any competition for this class of work. It is needless to argue that this is a wasteful system. A combination including all, or nearly all, the bidders could have afforded to take the Hartford bridge contract at a much lower price than any one of them could safely offer.

Another strong reason for the bridge combination is found in the necessity imposed upon the concerns having large works to meet the obstacles placed in their way by the bridge-brokers. There are not a few so-called bridge companies or firms which maintain no manufacturing plants, but act simply as parasites on those concerns which do have such plants. The methods of the bridge-broker are thus described:

Without so much as a blacksmith shop behind him, the broker has entered his bid upon every piece of bridge construction for which bids were advertised; and it has been frequently the case that his bid has been the lowest, and he has obtained the contract. Knowing the condition which has existed in a majority of the big shops, and the difficulty with which the plants were kept busy, he has taken advantage of it, and after obtaining the contract he has sublet it to the builders at a price below the cost of turning out the material. The builder has been compelled to accept the work and the broker's figures for it, or close up his plant. The new combination will "freeze out" the broker.

This does not mean that all competition in steel bridge-work is to be abolished. There will still be plenty of it, but it will not be so easy for competitors to force the carrying on of business at a loss, as formerly. The consolidation of the business of buying steel for construction-work should enable a large saving to be effected, and we do not see why it is not permissible to expect a real public benefit from the formation of the American Bridge Company. — *Hartford (Conn.), Times.*

A CASE IN POINT.

An architect and consulting engineer has been specifying Dixon's Silica-Graphite Paint for some little time. One of these specifications was for a new roof on a factory. About seven or eight months after the roof was painted two coats, the architect received word from the owner of the factory that the paint had all worn off the roof, and the tin was rusting; he insisted on having it painted again without expense to himself.

The painters were a well-known firm and in good standing, and they stated that they had simply put on the paint that had been specified, and if it did not last, it was not their fault.

The architect then came to us to have the matter fixed, and we opened correspondence with him in the endeavor to try and avert the necessity of sending the owner of the factory twenty-five gallons of paint free of charge to repaint the roof; at the same time we desired

to keep the good friendship of the architect.

After putting up as strong a defence as possible, so far as the quality of the paint was concerned, we found that both the owner of the factory and the architect were determined to make somebody stand the expense of repainting the roof.

We thereupon set out to find where the painters had bought the Dixon paint for the job. We found that they had purchased five gallons of Dixon's Silica-Graphite Paint from a local dealer, who carried it in stock, and that the balance of the paint used on the job was a paint called the "X. & Y.," of which it was judged they used about forty gallons.

The matter is now nicely adjusted; and the painters are going to repaint the roof at their own expense, and Dixon is relieved of any responsibility in connection with the job, and we retain the friendship of the architect, and also the friendship of the hardware firm who have been handling our paint in the city where this occurred, and who sold the five gallons mentioned above.

As our representative puts it: "This is one of the cases where the guilty parties came near sticking the innocent, but did n't."

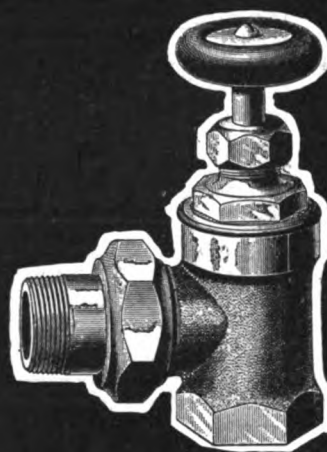
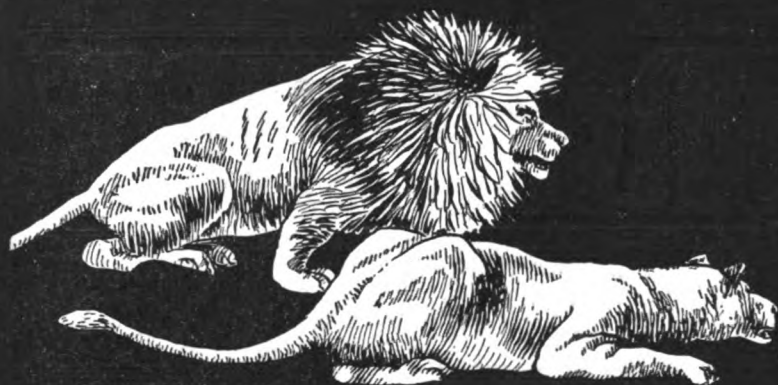
We have of course withheld the names of the architect and painters, and the name of the town, as these are not necessary in pointing the moral.

Specification of Paint. — Architects, consulting engineers, owners and persons interested in the subject of protective paint for steel structures will receive a handsome card illustrating several eighteen-story steel structures upon which Dixon's Silica-Graphite Paint has been used, if they will send their address to the Joseph Dixon Crucible Co., Jersey City, N. J. The card also contains suggestions for specification of the paint, and its well-known durability has led to its specification and use upon many immense steel viaducts, bridges and manufacturing plants all over the world.

The Glidden Varnish Co., of Cleveland, are building a \$50,000 addition to their Works, which, with the present capacity, will enable them to turn out as much varnish as the largest varnish plant in the world.

This Company has come to the front very fast during the last few years, and their famous specialties — Surfacing, M. P. Special Coach, and Jap-a-lac — have a world-wide reputation.

The new addition will be utilized principally for making Jap-a-lac, the new wood finish, one of the most elastic and durable varnishes ever offered to the trade.



STRENGTH in a Radiator Valve is a requisite quality.

A combination of strength and ease of operation in a radiator valve is one which was unknown until the Mackay was placed on the market.

Its construction is mechanically correct, and is such that its easy working qualities are not impaired by continued use.

The Mackay is the only valve made which will never stick, under any circumstances, and which may be operated by a lady or child after long use.

A quarter turn opens or closes the valve, and when open it gives full area of water way without obstruction.

The Mackay is the most satisfactory valve in the market and should be specified in every instance.

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GRAPHITE FOR AUTOMOBILES.

GRAPHITE, which plays an important part in the mechanical arts of the world, is found very useful in reducing friction in automobiles.

A very finely powdered graphite, when introduced into the cylinders of either steam or gas automobiles, very largely assists the oil which is usually employed for the purpose of lubrication.

It seems to be agreed by all engineers that no vegetable or animal oil should be used for the lubrication of engine cylinders. Mineral oil only should be used, but even the best mineral oil in the cylinders of gas-engines chars under very high heat, due to the combustion of gases. The heat in a gas-engine cylinder is said to be from 1,200 to 2,000 degrees F., and graphite only is able to bear this extreme heat.

Special graphite lubricants are prepared for the gears of both electric, steam and gas motors. For the driving chains on steam or gas automobiles, graphite in some form should always be used, as it saves power and at the same time so thoroughly lubricates the links that it will prevent the chains from breaking.

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(Continued on page 3.)

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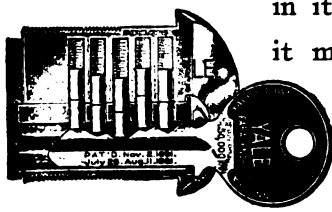
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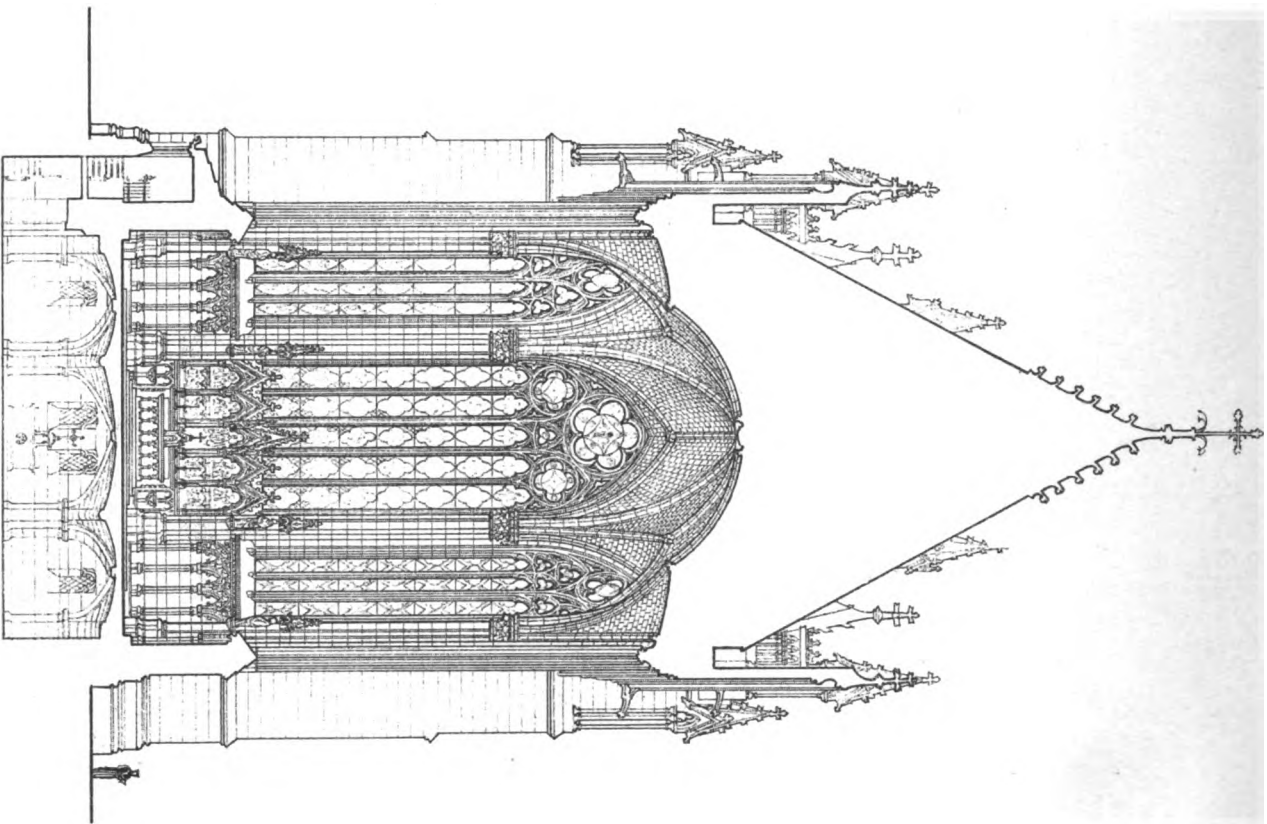
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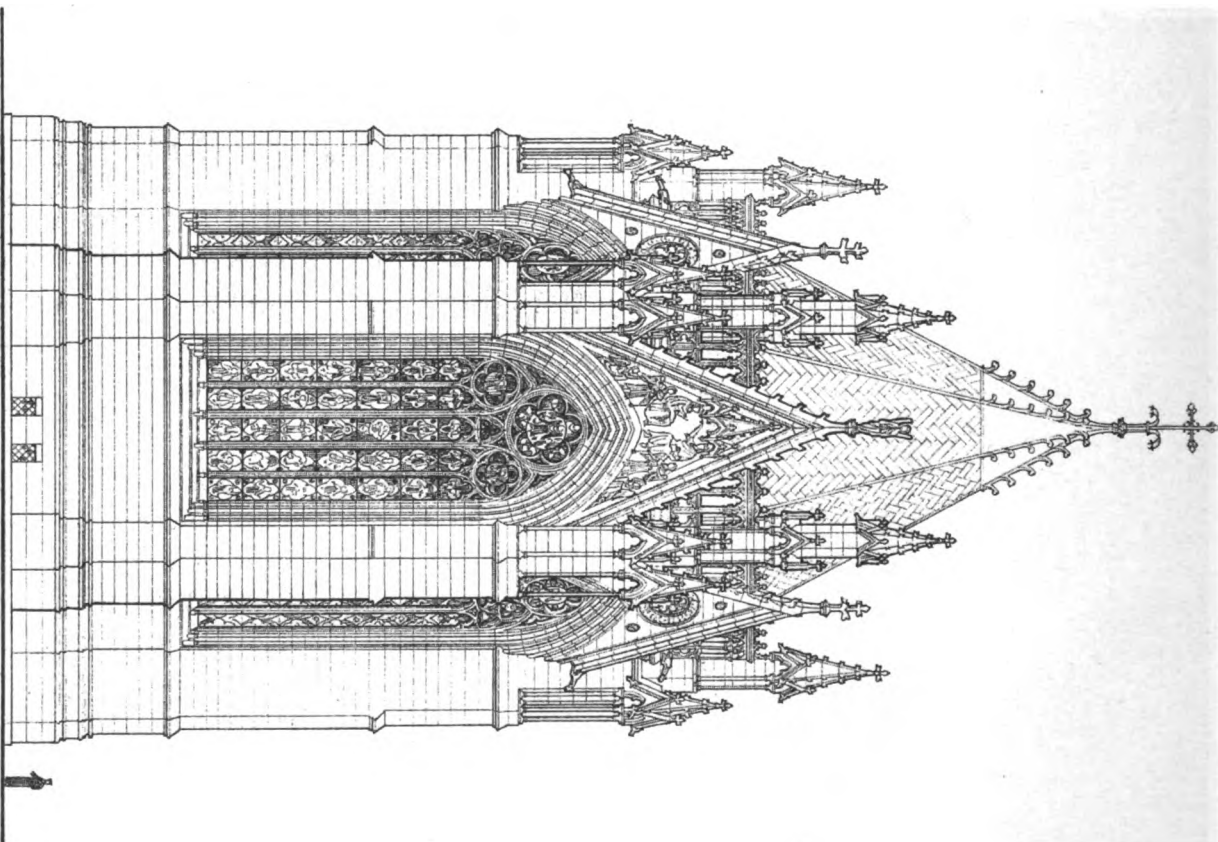
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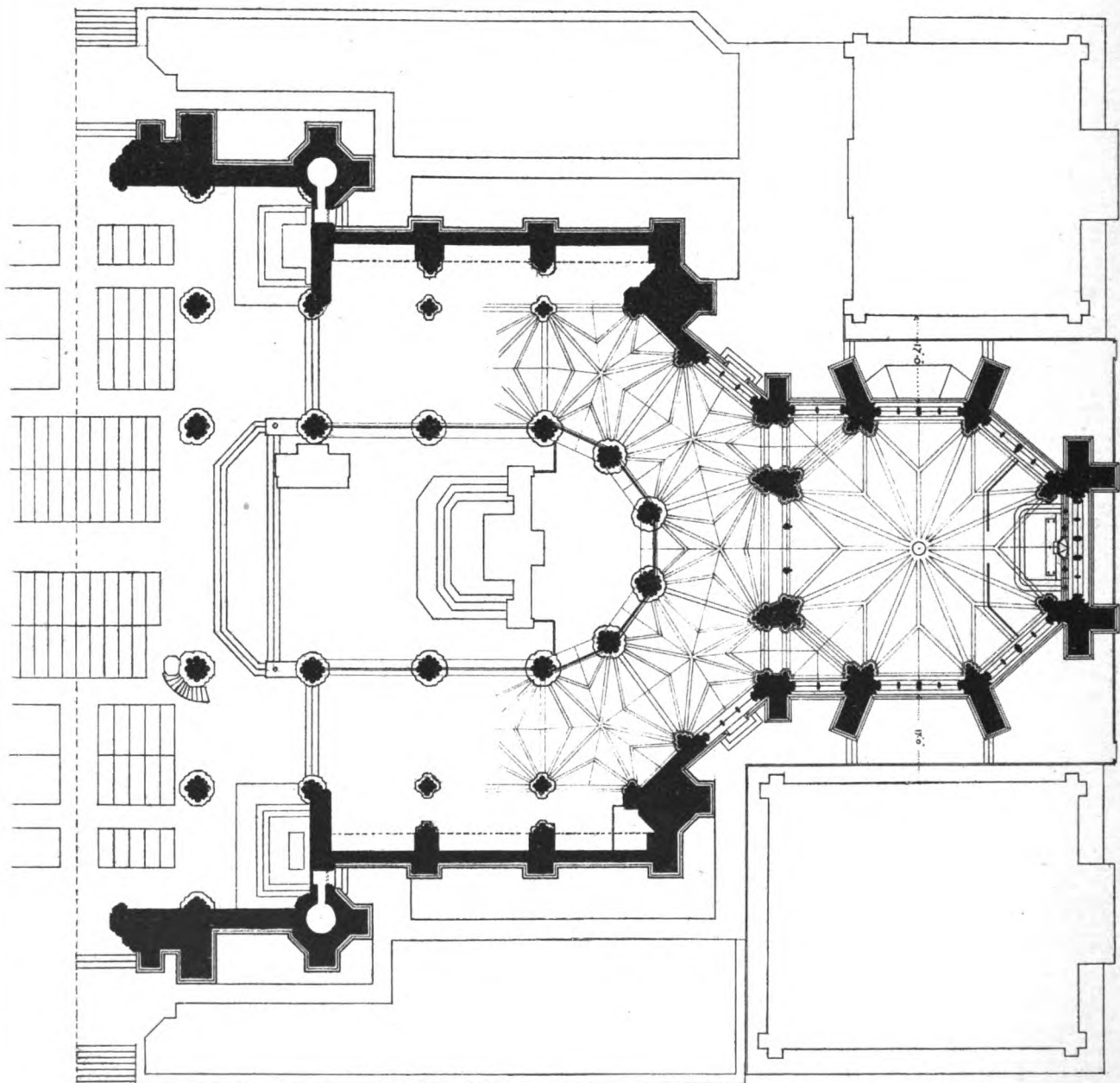
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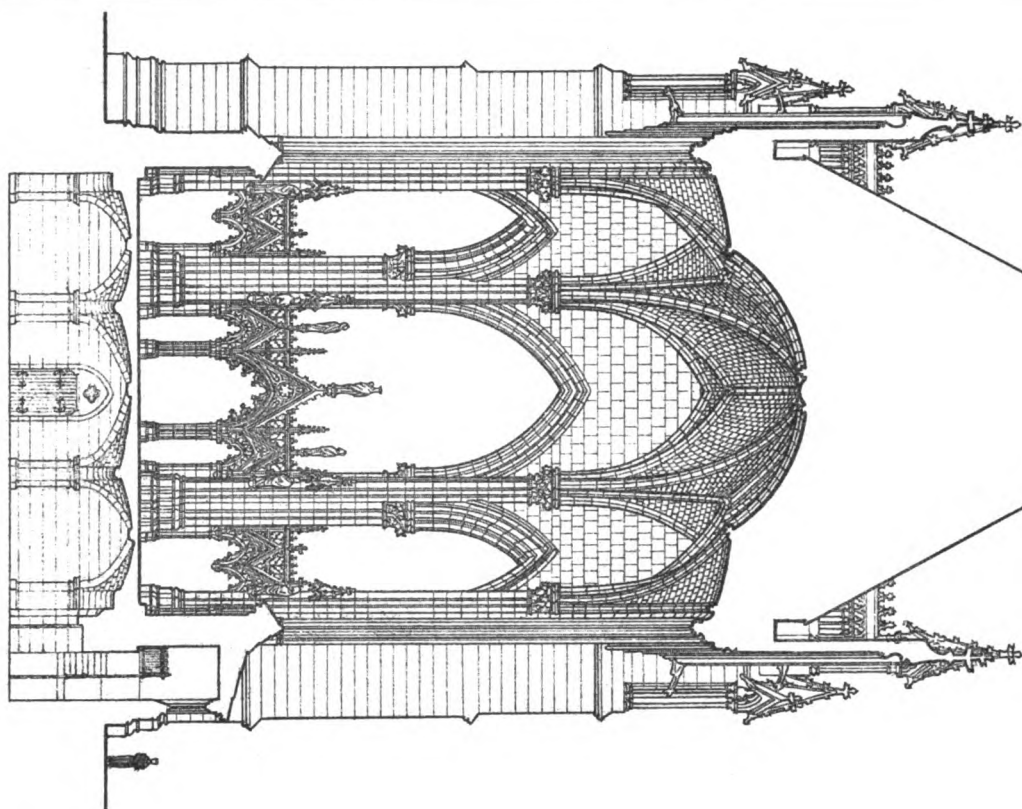
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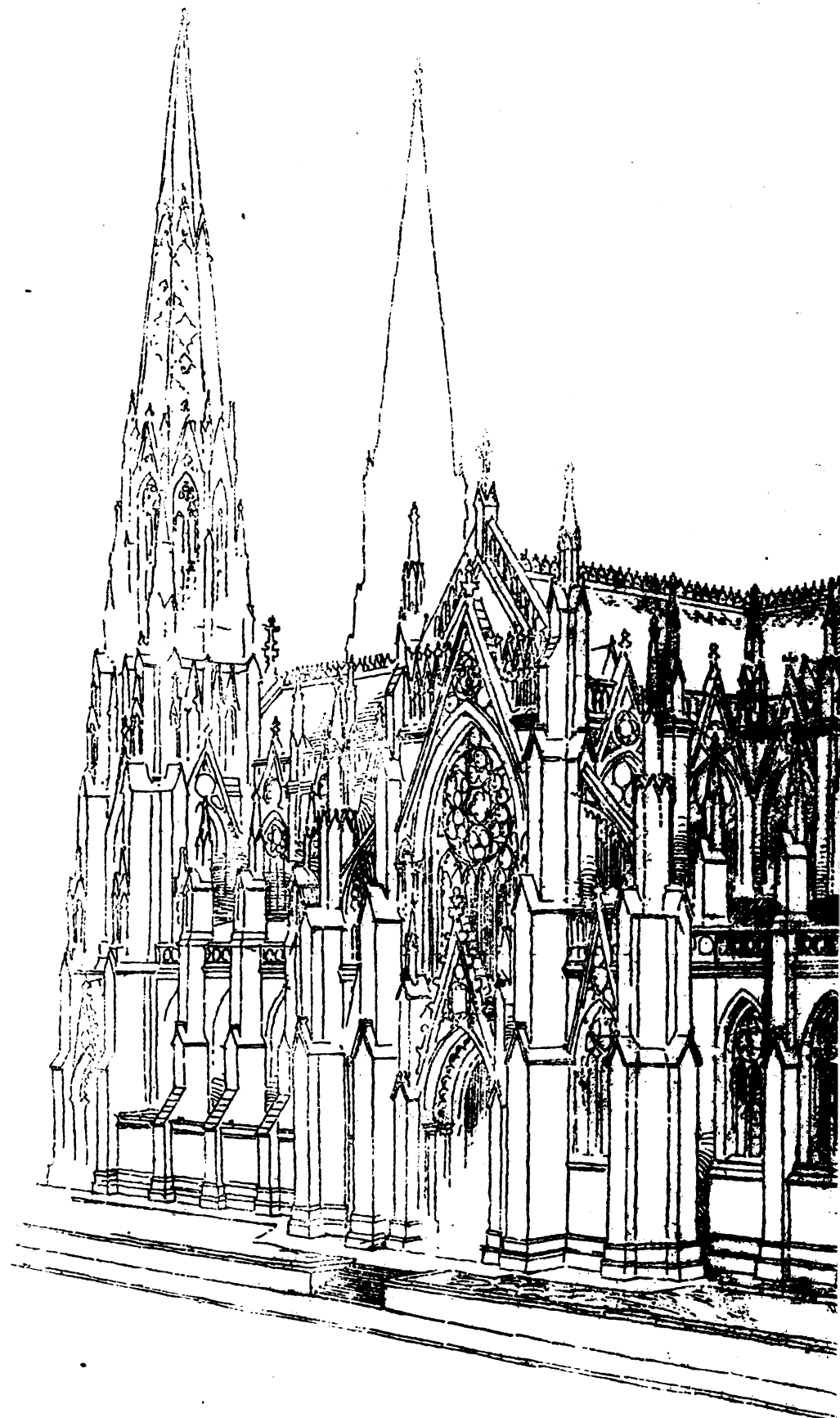


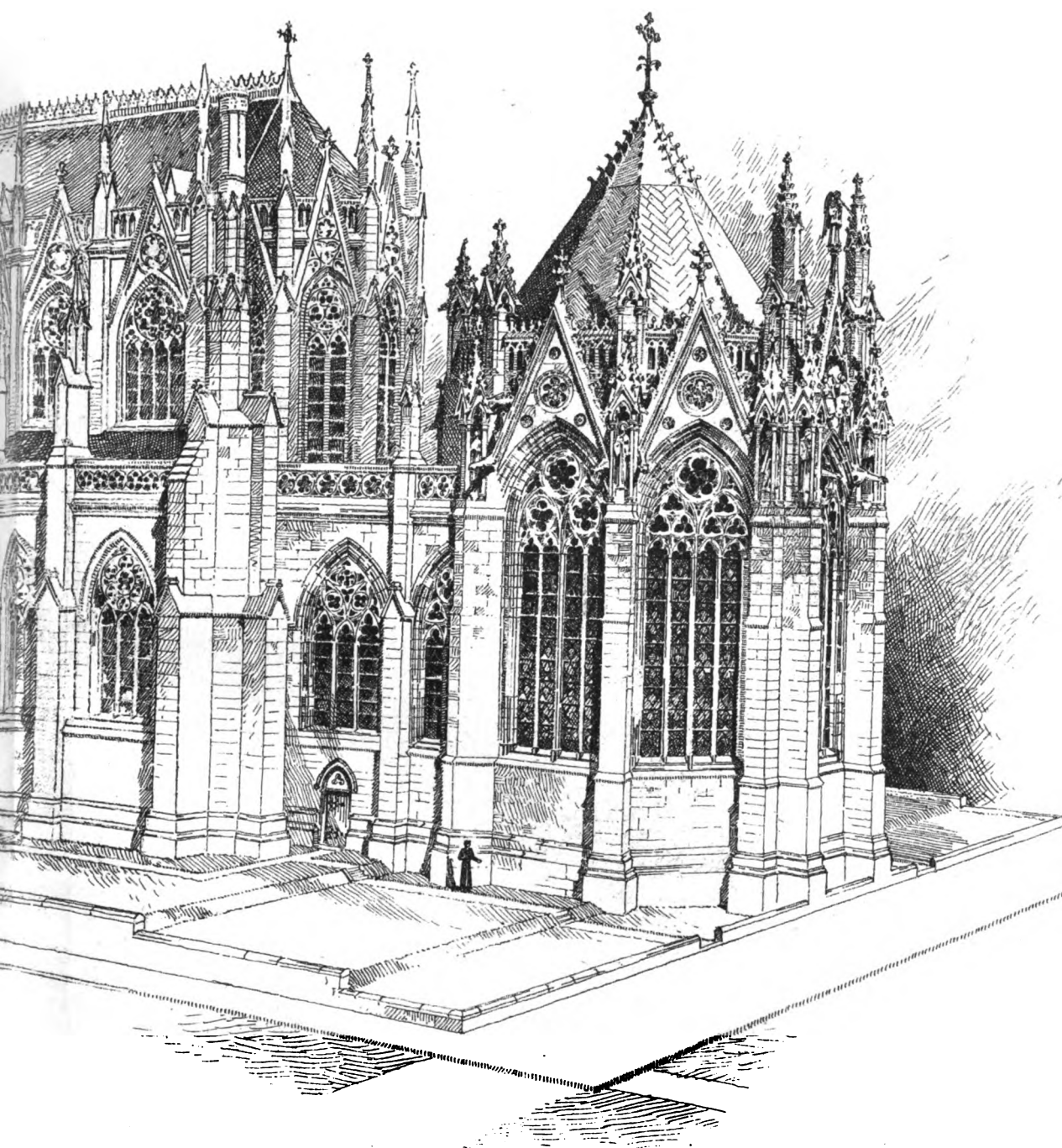
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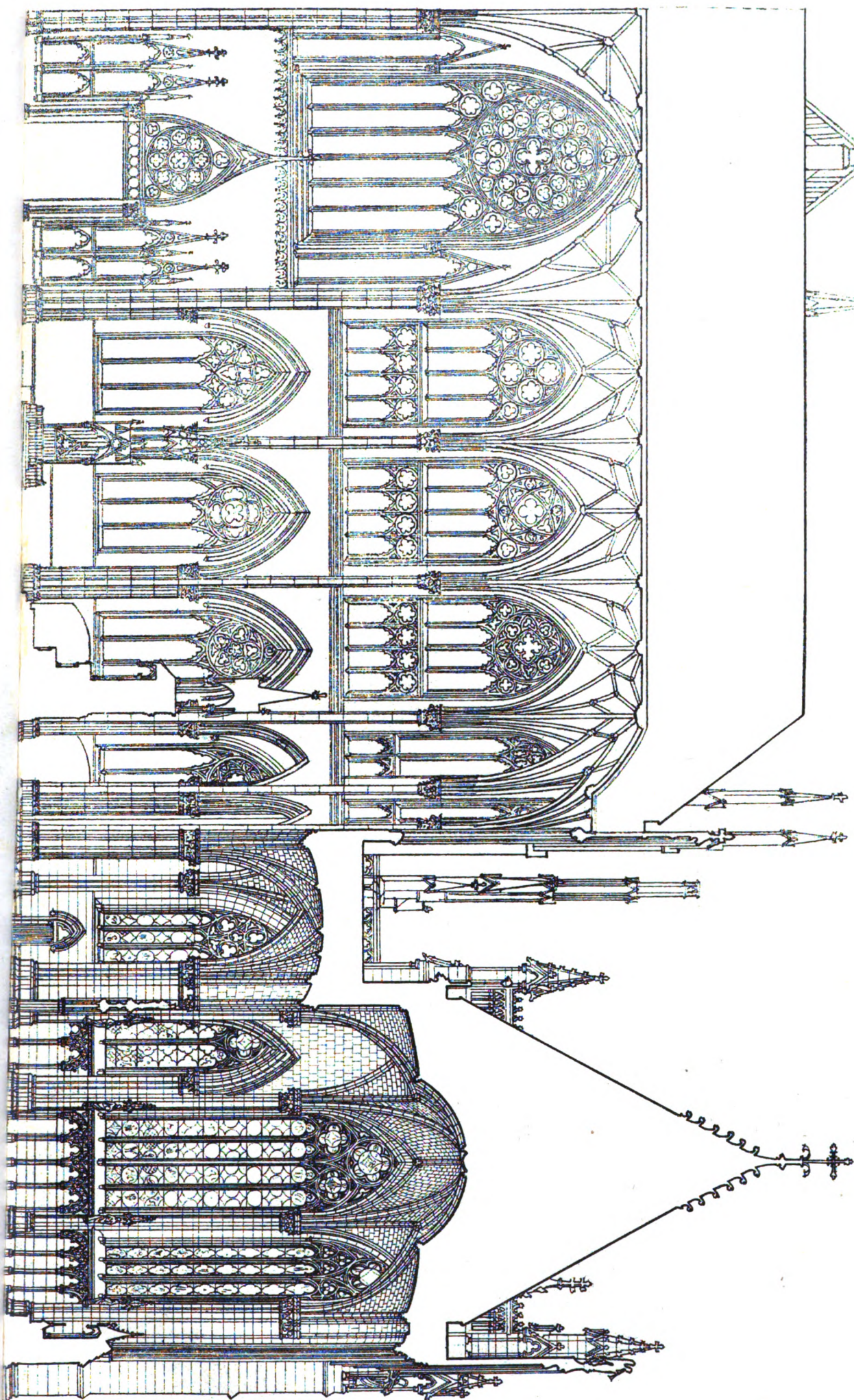
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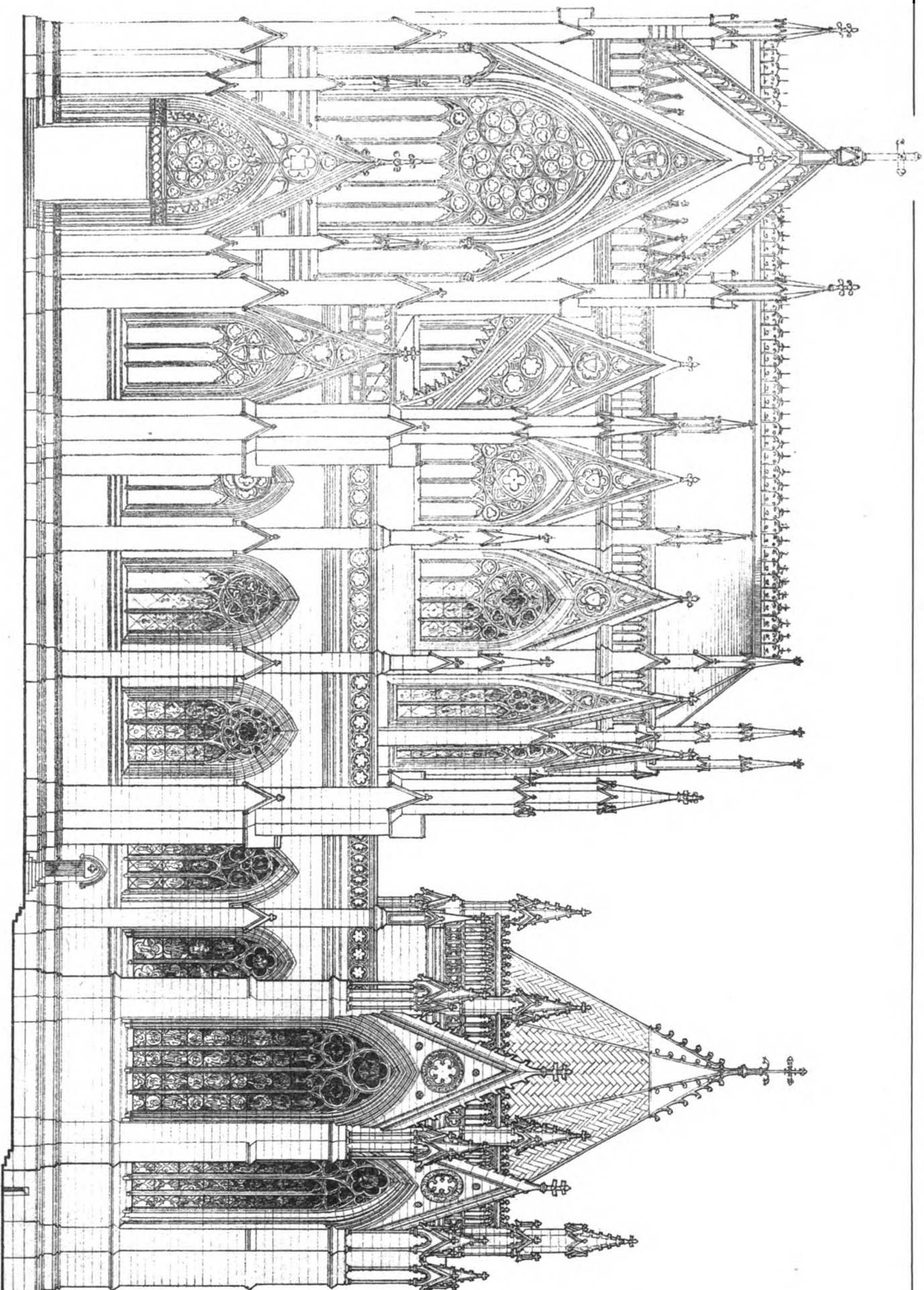


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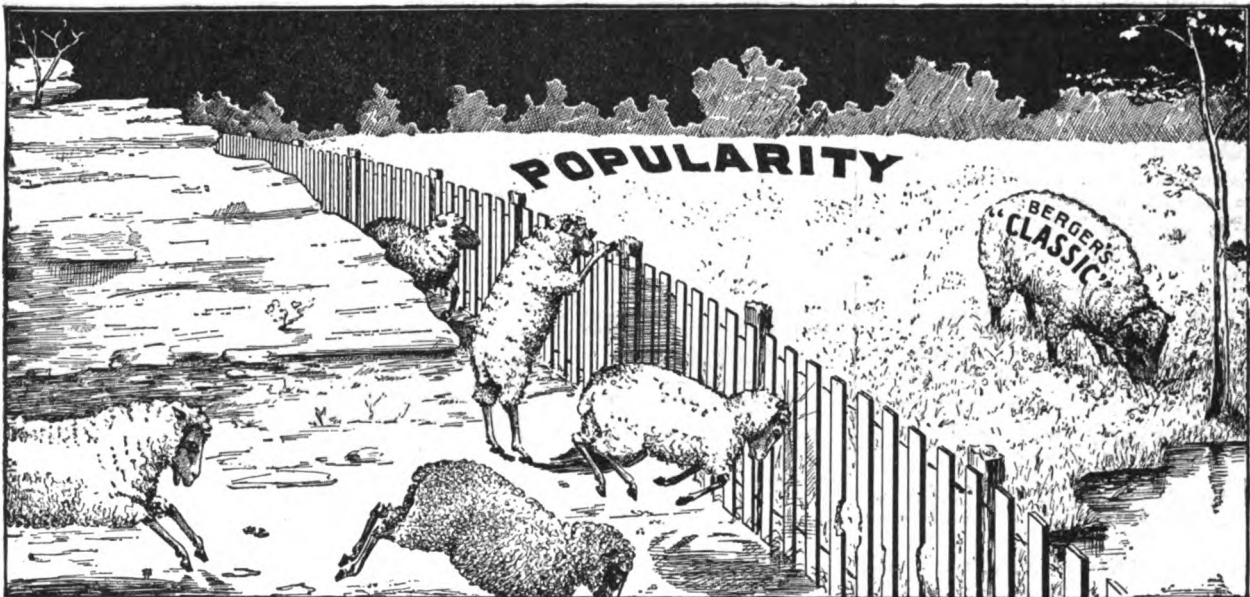
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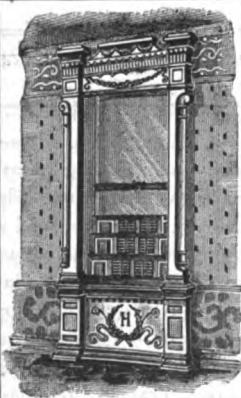
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Some believe that a great undiscovered passage exists between the Great Lakes and a body of open water about the North Pole, and that a disturbance there accounts for the wonderful ebb and flow of the water in the basin of the Great Lakes. Occasionally, on a trip to Waukegan some sailor announces that the boat passed over the very region where "Old Sub" is turning the water in, ice cold and in unlimited supply. In a little different way scientists have sometimes upheld the theory of a subterranean passage, which feeds the lakes, and cite the seven years' rise and fall of lake levels as a proof of it. Others take no stock in the theory of periodical movements.

But through it all there is the mystery which has not been fathomed yet by any plummet or measured by the rise and fall of any barometer. Long before the opening of the drainage-canal a variation of 5 inches in the lake level was known to be an ordinary affair. Sometimes the variation can be accounted for, but more often it cannot. Scientific men are as much at a loss as the veriest old salt.

Day in and day out the lake level changes aside from changes caused by the winds. No man knows why, and no man can reckon the times and the places of these lake "tides." So constant are the fluctuations that a general fall of 3 inches a year over the entire surface of Lake Michigan and Lake Huron would not be appreciable in the ordinary set of gauge readings. The automatic gauge shows an oscillation of the lake every twenty minutes, amounting sometimes to between 2 and 3 feet. In 1886, after the water had run down suddenly 6 feet in Chicago Harbor, an attempt was made to account for these oscillations on a scientific basis. Seven gauges were set about the lake and read at five-minute intervals. The upshot of it was that some of the observers decided that the phenomenon was due to a swing of the lake in its bed from shore to shore. Others did not think this reasonable, but had no better theory to advance. More remarkable still, it was found that one day's observations showed a general lowering over the whole of Lake Michigan of several inches.

As early as 1673 Father Marquette took note of changes in the lake levels. He asked the Indians about it, and they said that Lake Michigan swung from high to low and back again in fourteen years, or that every seven years the water ran the gamut. Baron La Hontan, in 1689, made some tolerably extensive notes on the variations in lake levels. He wrote that in twenty-four hours once, at the northern extremity of Lake Michigan, he saw the lake rise 3 feet and fall 3 feet in the day. He was first to observe the flow of water from Lake Huron to Lake Michigan, or from Michigan to Huron, which is now acknowledged.

"We cast our fishing-nets in the straits," says the doughty old explorer, "and for three days the current sucked them to the eastward so strongly that we could with difficulty haul them from the water. Then for two days the current set steadily toward the west, and carried our nets in that direction."

Stories of mysterious inundations by the lake, of times when the beach widened, and a great fringe was added to the sand along the shore, have always been current among Indian tribes. From Marquette, down to engineers and seamen of to-day observation has confirmed these legends. At Sault Ste. Marie, General Dearborn noted an ebb and flow of $1\frac{1}{2}$ feet of water in two and a half hours.

Lake Erie has been known to rise from 7 to 20 feet in a few hours. A few years ago, at Cleveland, the lake suddenly rose 5 feet. In 1886 Lake Michigan rushed up to a height of 7 feet above the ordinary level at Milwaukee. In that year the water fell 6 feet in Chicago Harbor, and somewhat less in the lake within a few minutes. High-masted schooners careened to one side, and the big poles knocked together confusedly. It looked as if the Chicago River would be drained dry in half an hour, and the experience has never been forgotten among the Chicago seamen. In 1848, it is said, the same thing occurred.

In addition to these sudden and inexplicable changes in the lake level, there is a tolerably well-defined periodical movement of the surface extending over a number of years. Sometimes it is claimed that this movement requires seven years, sometimes ten years. Ossian Guthrie and others declare that the movement is not periodic, but that it usually extends over from two to ten years. Then there is an annual rise of the lake from January to June, caused by the ordinary spring rainfall, which runs the level of the lake up about one foot higher in June than in January. For thirty years consecutively the spring rise was found to be $14\frac{1}{2}$ inches. A series of heavy spring rainfalls will raise the level of the lake 3 or 4 feet above datum for a number of years, and a series of droughts will reduce it correspondingly.

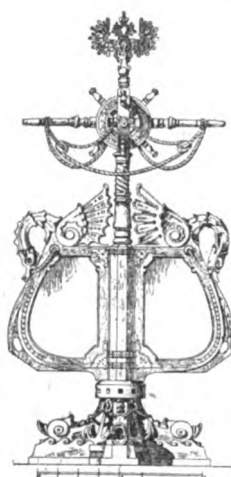
Beginning with 1847, Ossian Guthrie has kept a record of the fluctuations of the level of Lake Michigan. In 1847, as has been stated, Lake Michigan went very low. From 1847 to 1859, with occasional lapses, it crept up nearly 3 feet above datum. From 1859 to 1863 it fell, then it swung back to $2\frac{1}{2}$ feet above datum in 1876, ran down in 1879, going up abruptly in the spring of 1880. From 1880 to 1886 the lake level rose 3 feet. From 1886 to 1892 it fell about 4 feet. In the spring of 1893 it rose 15 inches in a few days' time. Since 1893 the lake has been going down, and during most of last fall and this spring it has been below the 1847 mark. To-day, owing to the usual rise from rainfalls, the lake is higher than it was before the opening of the drainage-canal. Figures at the United States engineer's office show that during January, February and March the lake level was just about what it was in December of 1899, although each day's record shows a variation of several inches.

On January 11 there was a variation in the lake level of 1 foot. From February 11 to February 12, in 1894, the lake level at the foot of Randolph Street rose a little over 2 feet.

These daily fluctuations of from 6 inches to 2 feet are accounted for, engineers believe, by winds and by barometric pressure. A strong east wind will easily raise the surface of the lake here 2 feet. Again, if the atmospheric pressure all over the surface of Lake Huron is suddenly reduced, the water will rush through the straits from Lake Michigan, and Huron will rise, mysteriously perhaps, on a perfectly calm day.

Engineers at the office of the Drainage Board estimate that if no rainfall were to reach Lake Michigan, and the maximum flow of 300,000 cubic feet of water drawn off through the drainage-canal, it would take a little over eight years to reduce the level of Lake Michigan 1 foot. As a matter-of-fact, the annual rainfall always produces a waste overflow past Niagara which greatly exceeds that drawn off by the drainage-canal. If the water were not taken through the canal it would go over Niagara during spring freshets. In general, engineers agree that the physics of Lake Michigan and of all the Great Lakes has never been studied accurately, and that the mysterious movements of the immense inland seas offer a comparatively unworked field for useful and scientific research. — *Chicago Inter-Ocean.*

MONIER CONSTRUCTION.¹



Picture Show-case for the Russian Navy Department. From *Stroitel*.

THE writer welcomes every proper form of popularization of engineering and architectural constructions in cement and steel in combination. But he thinks it will greatly advance the practice of this new system if it is relieved from the burden of a proprietary name and from the suspicion of being a patented system. It can be easily shown that any one is at liberty to employ steel and concrete in combination in almost any way he chooses, without infringing any fundamental patent. There are a few patents upon particular combinations of steel and concrete which may be made to hold, but these can be avoided if one so desires.

As to Monier's claims, they seem to the writer to be practically nil, so far as priority of use is concerned. Neither does it appear that any American patent on this system has ever been taken out. It seems that Mr. W. E. Ward, Member of the American Society of Mechanical Engineers, of Port Chester, N. Y., was the first to use iron or steel in combination with concrete in a thoroughly scientific manner. In a paper before the American Society of Mechanical Engineers at the Cleveland meeting, in June, 1883, Mr. Ward described at length the construction of a residence wholly of reinforced concrete, which he designed and built in 1875.² He says he began his experiments to this end in 1871, and began planning for these in 1867. He claims the "invention" of this system of construction, but has freely given it to the public, apparently never having applied for a patent upon it. In France, letters-patent were granted in 1869 to François Coignet on a "Combination of Iron and Concrete," so that Monier's use of wire-netting in concrete for the manufacture of large vases (for orange trees) and small tanks, in 1876, loses all significance. Furthermore, Monier was a gardener and used his wire-netting in the body of his concrete merely to bind it firmly together and to prevent cracking. He had no knowledge of the stresses in a beam, and the use of the iron to resist the tensile stresses while the concrete is relied on to resist the compressive stresses. Thaddeus Hyatt, also, in his work on "*Concrete-Iron Construction*," 1877, reports tests made for him by Kirkaldy, London, in 1876 and 1877. Both Hyatt's book and Ward's paper seem to have dropped out of notice. Hyatt seems never to have heard of Monier. It is Ward in America and Hyatt in England, therefore, to whom credit is due for a scientific combination of these materials. Hyatt acknowledges that the combination is not new, but claims that these two materials had not previously been intelligently combined in building-construction.

The reason this system came to bear Monier's name is because it was patented and exploited in France and Germany under this name, and has now been brought here from Germany. The Monier construction proper seems to be adapted only to circular tanks and to arches symmetrically loaded. Where bending-moment has to be resisted, the adaptation required is so different from the true Monier (imbedded wire) construction that it should no longer bear his name. It should more properly be called cement-steel, or steel-cement, construction. When plain wires or rods are used, reliance being placed solely upon the adhesion of the concrete to the wires, they are sure to work loose if there is much jar or variation of stress. I have been told that this has been the case in the Studebaker Building, Chicago, to such an extent as to necessitate the replacing of

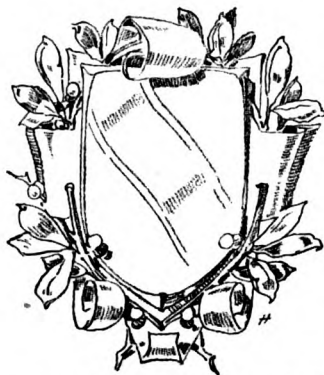
¹ Discussion by Mr. J. B. Johnson of a paper at the meeting of the Western Society of Engineers and published in the *Journal of the Society*.

² See *Proceedings of the American Society of Mechanical Engineers*, Vol. IV, page 388, and the *American Architect* for August 18, 1877.

floor systems. The steel bars should be twisted, as in the Ransome construction, or better, they should be crooked or grooved so as to take a firm hold of the concrete. Where cement-mortar alone is used the adhesion to plain wires will be sufficiently high to warrant the use, but in concrete the adhesion to plain surfaces will be found insufficient.

As to this construction being "absolutely fireproof," it is difficult to see how it can be any more fireproof than the concrete of which it is composed. If this concrete material be a cement, mortar and crushed stone or gravel, it is far from being "absolutely fireproof."

THE WORLD'S GREAT FIRES.



U. C. CROSBY, late President of the National Fire-protection Association, has compiled a very interesting list of the world's great fires. In describing some of the most important disasters, he says:—

"London was nearly destroyed by fire in 798; again in 982, 1212, and 1666. The latter fire is known in history as the 'Great Fire'; it burned over a territory of 436 acres, including 400 streets; 13,200 buildings and property-value upward of \$53,000,000 were destroyed. Edinburgh was nearly destroyed by fire in 1700. Lisbon was burned in 1707. Venice was destroyed by fire in 1106 and again in 1577. Berlin was destroyed in 1405. Berne in 1634, and again in 1680. Hamburg was nearly destroyed by fire in 1842; 4,219 buildings were burned, and 100 people lost their lives; property value destroyed, \$35,000,000. Copenhagen was burned in 1728; 1,650 houses destroyed; again in 1795, and 1,563 houses burned. Stockholm in 1751, with 1,000 houses destroyed. Moscow in 1752, visited by a large fire; 18,000 houses destroyed. Again in 1812; this time the fire set by Russians in order to prevent the French occupation of the city; 38,000 houses were destroyed, and over \$150,000,000 of value.

Constantinople has been the scene of numerous and costly fires; in 1729 a great fire destroyed 12,000 buildings and nearly 6,000 people. In 1745 another great fire lasted five days; again in January, 1750, 10,000 buildings destroyed. In April, the same year, another fire, with \$15,000,000 of property destroyed. Again, later in the year, a fire destroyed 10,000 houses; in 1756, 15,000 houses were destroyed and 100 lives lost. In 1782, 10,000 houses were burned; in 1791, between March and July, serious fires destroyed 32,000 houses, and nearly the same number were destroyed again in 1798. In 1816, 12,000 houses and 3,000 shops were destroyed. In 1870 Pera, a suburb of Constantinople, was nearly destroyed, 7,000 buildings and over \$25,000,000 property-value being consumed.

"Smyrna had great fires in 1763, 1792, and 1841, destroying from 2,000 to 12,000 buildings at each fire. Great fires have occurred in India, China, and Japan; in many cases large cities were entirely destroyed. In Quebec, in 1845, 1,650 buildings were destroyed, and the same number in May and June following; and in 1866, 2,500 buildings and 17 churches were destroyed. St. John, N. B., 1837; nearly all the business portion was destroyed. In 1877 the 'great fire,' over 200 acres burned, and ten miles of street; about \$13,000,000 of property-value. St. John's, Newfoundland, in 1846 was nearly destroyed, and \$50,000,000 of property-value burned; again a big fire in 1896. Montreal in 1850 had a great fire; 250 buildings destroyed; in 1852 about 1,200 buildings were destroyed. Various cities in South America and West Indies have been destroyed by fire; in some cases property-values of \$30,000,000 and upward were destroyed; a large loss of life resulted also.

"The United States has a record of destruction of property by fire not equalled by any other country. Charlestown, Mass., in 1796, \$300,000; in 1838, 1,158 buildings. Savannah, Ga., in 1820, 463 buildings and \$4,000,000 value. New York, in 1835, 530 buildings, 52 acres burned over, and \$15,000,000 of property destroyed; in 1845, 300 acres burned over, \$7,500,000 value, 35 lives lost. Pittsburgh, Pa., in 1845, 100 buildings; \$1,000,000 property-value. St. Louis, Mo., in 1849, 15 buildings; \$3,000,000 value; in 1851, 2,500 buildings destroyed. Philadelphia, Pa., in 1850, 400 buildings. San Francisco, in 1851, 2,500 buildings, and a number of lives lost; property-value, \$10,000,000. Portland, Me., in 1866, over one-half the city; 200 acres burned over, and 1,743 buildings destroyed. Chicago in 1871, known as the 'Great Fire'; 2,124 acres nearly covered by buildings entirely burned over, including 17,430 buildings; many lives were lost, and property-value of upwards of \$106,000,000 was destroyed. Boston, Mass., in 1872; 65 acres of the mercantile section burned, including 776 buildings; nearly all of brick-and-stone construction; property-value, \$75,000,000."

"The Oregon Forests. — Oregon has three forest-reserves — the Cascade Range Reserve, area 4,492,800 acres; the Bull Run, area 142,080 acres, and the Ashland, area 1,560 acres, or an aggregate area of 4,663,440 acres. — *N. Y. Evening Post*.

BOOKS AND PAPERS.

DURING the past ten years or more the houses of the working-classes have been attracting a great deal of attention both in England, on the Continent and here. Each new contribution adds somewhat to our knowledge of the subject, and each experiment tried teaches some lesson. Generally, however, circumstances vary so much in different countries that the experience of one does not, to any great extent, benefit another.

The latest contribution to the housing problem is a volume containing plans, elevations and descriptive letter-press by Messrs. Cranfield & Potter. For English uses these plans are excellent and the descriptions are sufficiently clear to give even an amateur a thorough understanding. The plans follow established English types and the elevations are good examples of the use of common material. They are, however, wholly unsuited to our climate, our customs and our people. Whether our people would be better off if they could learn to be content with and to like these things is a social question of considerable complication.

The authors deplore the high cost of buildings — owing to price of labor, or material, and to stringent building-laws; but they estimate their buildings at 1*d.* per cubic foot, which does not seem high to us. High wages are by no means an unmixed blessing to the working man. They bring increased cost for pretty much all he requires, shelter, food and clothing, and by putting large sums of money in his hands lead him to think that he can afford expensive amusements, gay hats for his wife, and such like things, and need not practise economy, as must the man in a slightly higher class.

In housing the poor near cities the separate dwelling is preferred to the tenement, and the present book is concerned with small, independent houses in a block and with two-flat houses. The problem presupposes a large area to deal with, and the authors suggest making small yards, back and front, and keeping the centre as an enclosed play-ground and garden, with a service-road running through. A good plan, but not novel, and, as shown in the book, capable of being improved.

The construction of these houses cannot furnish us examples, but it might at least suggest the possibility of improvement in building-laws which should encourage fireproof-construction even outside of fire-limits.

The walls are either 9 inches or 4½ inches, the latter sometimes rough-cast for greater protection against weather, and the roofs slate, probably laid on battens. The carrying of the party-walls above the roof-line is a serious difficulty in such a row of tiny houses (most of them about fifteen feet wide and one-and-one-half stories high), for it adds to the expense and to the likelihood of leaks. It certainly seems as if some better method of fireproofing between houses might be devised — as, for example, bedding a plate on the wall, and putting on small nailing-strips bedded in cement to take the slate.

The dimensions of rooms are, on the whole, a little smaller than what is considered the minimum here — and our minimum is looked at askance by our fastidious working-man.

In the designing of the houses there are three or four things which make our problem wholly different. *First.* — Heating. No one would dream of cooking at an open fireplace, or of heating rooms thus. *Second.* — Plumbing could not be done in a one-story out-building. *Third.* — We could not omit cellars. *Fourth.* — Staircases in the centre accessible only from rooms would not do. *Fifth.* — A half-story on the second floor (what the English call the first) our workman considers very poor accommodation. The first four are really vital and make these English plans quite useless for us.

To consider the plans more in detail. The bedrooms seem to be the poorest features. Here one would consider that a bed, a bureau, a wash-stand and a chair were a necessity, and that where closets could not be afforded there must be space for a wardrobe, or at least some hanging-space. To accommodate these, 7'6" x 11' has been found to be about the minimum. In these plans one finds in almost every house a room no more than 7' x 7', and in many cases even this space is reduced by raising part of the floor for head-room on the staircase. The only possible way of using the room on Plan A would be to make a bed on the bulkhead over the stairs, which would have to be about thirty inches above the floor. In some of the larger houses, on the double-tenement basis, that is, one family on each floor; the ground-floor suite consists of parlor, living-room and scullery, with only one bedroom; and the second-floor tenement of parlor, living-room and two bedrooms, one of these opening out of the parlor. This would not be considered good planning here. Further, in a tenement of this dimension (575 floor feet) there should be more room for stores, clothes, etc.

The general remarks on planning are chiefly mere elementary principles — such as that staircases should not be dark, that rooms should have window-area equal to a tenth of the floor-area and that at least half should open, that water-closet and pantry should not be adjacent, and that the coal-bin should be readily accessible from the outside. The plans do not always conform to even these elementary rules. There are few new suggestions: that of sinking a tub in the

"Houses for the Working Classes in Urban Districts." By Sidney White Cranfield and Henry Ingie Potter. Publisher, B. T. Batsford, 94 High Holborn.

concrete of the scullery floor does not recommend itself. With us the class that rent the cheapest houses do not appreciate the tub, and if they did would not use such an arrangement.

The more detailed description of the various sets of plans are interesting—sometimes suggestive. The smallest plans with a frontage of 11 feet and an area of 375 feet, seem impossibly small, and yet there are four rooms and a scullery. To be sure, the stairs and coals are in the centre, water-closet and pantry adjoin, and in the modified plan, which gives five rooms, one bedroom is of the bulkhead type previously mentioned. When, however, one considers how comfortable neatness and care can make a steamer state-room, one wonders if the tiny house well arranged is not really as well able to give true comfort as a larger one, providing always that these bedrooms of 100 feet have but two occupants at the outside.

So much depends in these small places on the old adage, "A place for everything and everything in its place." A living-room or bedroom intelligently planned to accommodate the necessary articles, when so used and neatly ordered, may be more comfortable and livable than a room twice as large which has been ill-planned, or which is kept in slovenly fashion. The lesson of neatness is all-important for the tenant of one of these miniature houses.

Group B houses are slightly larger and give entries, otherwise they are no improvement on the smaller plan. The bulkhead bedroom is evidently a hobby of the authors', as it is again and again suggested as an improvement enabling one to get two bedrooms in a space fit only for one.

Group C shows plans arranged with the common device of an irregular party-wall giving each house alternately increased width, front and rear. This would be a very appreciable item in cost, especially where it must be carried through the roof.

In Group D most of the objectionable features of the preceding plans have been removed (except the favorite bulkhead bedroom), but one plan (an existing type) has five chimney-stacks for each pair of houses and an irregular party-wall. This would seem extravagant in a house of 15 feet frontage, containing but five rooms. D⁴ is a type generally condemned here, central plumbing opening on a narrow area, but where the building is but two stories the chief objection is removed. With us this plan has been used for six or eight story apartments. D⁶ is, perhaps, on the whole the best plan shown. It is compact, free from breaks in party or external walls, and not open to the objections pointed out in the other plans. The area is 944 feet, about the same as B⁴ and most of the C group, but gives far better accommodation. This double house is estimated at £85, about \$400; with us the cubic contents (20,414 feet) could not be contained in wooden walls for less than six cents a foot—our building would have to have a cellar, which would add nearly one-third to cubage; without cellar it would cost \$1,200, and with cellar at least \$1,600. Then, the method of construction in England would be impossible here. A wall two bricks thick, plastered without furring, would not keep out our driving rains unless kept constantly painted, nor would a slate roof laid on battens protect from either heat or cold, nor would it keep out drifting snow. On all such lines we must buy our own experience. These plans and methods of construction may answer admirably in England, but they would be absolutely out of the question here. There is, however, no reason why we should continue to build cheap houses of inflammable material—we could build light walls of various fireproof and cheap materials which would be strong and dry, but the majority of our city building requirements, in the rigidity of their laws as to brick buildings, distinctly encourage wood where it is permitted. This is bad policy from every point-of-view. It encourages cheap buildings, made to sell and not to last, unsightly buildings which ruin a neighborhood, inflammable buildings which threaten one another and the neighboring city as well.

Group E plans are of the area-lit type—never advisable if it can be avoided, but sometimes a necessary evil where lots are deep and must be narrow to avoid extravagance.

Group F shows double tenements; a form very popular here, but not to be recommended where the single house is possible. The smallest plan F¹, with scullery in a half-lit entry, is below the standard of anything which would rent here. Group G are similar, and represent a type which with us would be made seven or eight stories, and fitted with better stairs, lift and better plumbing, and would be better planned, to avoid rooms without doors on an entry.

It may seem from what has been written that the book is without merit and without applicability to our country, but there are certain lessons to be learned—not so much by the owners and builders of such houses as by the tenants, and this will be a difficult lesson to teach. A people who make good wages and earn money with comparative ease find their chief enjoyment in spending it, and if they prefer to do this they have their reward. As long, however, as this remains their point-of-view, it is no use to attempt to give the working-people very cheap and economical houses. One is inclined to think that the disregard of economy is a widespread habit, due to the easy circumstances of a new and rapidly expanding country, and which it is very difficult to shake off.

In France and in England a gentleman with \$15,000 or \$20,000 a year will be as careful of all his expenditures as the clerk supporting his family on \$1,500, not so much because he must, as because he prefers to get as much as possible in the way of actual return for his money. The same man here considers that he has a substantial return in the fact that he lives without care. This same spirit pervades to a certain extent our working-classes—they want comfort,

even luxury, and would rather spend their money in that than live with close economy and put more in the savings-bank. To meet this, a class of house has been built which is roomy, fitted with heat and plumbing, showy and tawdry. It is not built to last, but with a view to selling to the tenant, who often finds himself possessed of a building which deteriorates so rapidly as to make repairs a heavy annual item. Often repairs are neglected until the value of the house is almost obliterated.

There is another condition of our circumstances which changes the problem very materially. Our people all want to own both land and house rather than rent them. Urban land is too valuable to be covered with such small houses as we have been considering. The workman, therefore, will find his house in a suburban district and he will want a detached house and not one in a block. On the other hand the owner of the city land cannot get a fair return unless he can get a large rent. He will, therefore, turn to the many-storied tenement. The separate house and the tenement are, therefore, our problems.

For the cheapest kind of independent house the semi-detached is probably the best. This can readily be so planned as to give privacy to each family and to group the outbuildings and arrange their surroundings so as to be to their mutual advantage. Such buildings should be of brick, cement or plaster, and roofed with slate or some fireproof material. If the prejudice against attic rooms could be overcome, a single story with light walls and a large gambrel roof would afford excellent accommodation. Party-walls would, of course, be brick.

When all is said and done, direct contact with the working-man and intercourse with him is the best way to find out what he wants and the best way to get him to accept suggestions. Without this, theories, plans, even actual buildings, are of little use.



[Contributors of drawings are requested to send also plans and a full and adequate description of the buildings, including a statement of cost.]

A COMPETITIVE DESIGN FOR THE LADY CHAPEL OF ST. PATRICK'S CATHEDRAL, NEW YORK, N. Y.: THREE PLATES. MESSRS. N. LE BRUN & SONS, ARCHITECTS, NEW YORK, N. Y.

IN order to minimize the labor of the competitors and at the same time lighten the difficulties of examination and comparison, the Archbishop's professional adviser, Professor Ware, furnished the competitors with identical outline drawings of the present Cathedral, printed in light-gray ink on Whatman paper, the portions of the east end where the new design was to be drawn in being left blank. Both the competitors and the expert found the device of such great advantage that it is to be hoped that in any similar cases it will always be adopted.

The only disadvantage the method has is in cases of reproduction, where only one printing is possible, and we speak of the matter to account for the somewhat coarse and sketchy character of the lines which represent the untouched old work, as they interfere with the more delicate rendering of the Lady Chapel portions of the drawings rather more than they should. To the competitors, Professor Ware made the following report:—

"The design selected for the Lady Chapel of the Cathedral of St. Patrick proves to be the work of Mr. Charles T. Mathews, of 150 Fifth Avenue, New York City.

"Owing to some delays at the Custom-house, the drawings were not ready for the Archbishop's examination until Wednesday, the 25th of April. In order to preserve as far as possible a perfect *incognito*, the French drawings were lettered after their arrival in this country, and the descriptive paper accompanying them translated and typewritten.

"His Grace sailed for Europe on Sunday, the 29th, but he had time before he went to examine the drawings, and, while disclaiming any wish to control the decision, he indicated four of them which to his own mind seemed preferable. The final decision, however, he committed entirely to Messrs. Eugene, Edward and Thomas H. Kelly, the sons of the late Mrs. Eugene Kelly and the executors of her will.

"Of the fourteen designs submitted, two were somewhat exceptional in character, one of them having the shape of a Greek cross, the other that of a letter T. This was set crosswise on the plot of ground facing upon 51st Street. Of the remaining twelve, four showed a nave without aisles, four a nave with aisles or side-chapels, and of the other four, the plan of one had the shape of a circle, one of a decagon, one of an octagon and one of a hexagon. In seven of the designs the straight east end of the Cathedral was not disturbed, in seven it was reconstructed so as to give at the east end of the chancel a wide aisle running around the apse, forming a sort of *chevet*. In width and height these designs varied as much as the somewhat restricted space and the conditions imposed would permit, some rivalling the Cathedral in height, or even overtopping it, others taking a distinctly subordinate place. The approximate estimates varied accordingly from less than \$200,000 to more than \$400,000, and if the minimum

prices for all the different items were added together and this sum compared with the total of the maximum prices, the total range would extend from less than \$150,000 to more than half a million. But most of the figures ranged between \$225,000 and \$275,000.

"In point of architectural character there was less to choose, for while two or three of them were of exceptional interest, and two or three others hardly met the requirements of the case, the rest were singularly uniform in architectural merit, and in point of draughtsmanship there was little ground for discrimination among them. Moreover, while the French drawings clearly betrayed themselves by marked peculiarities of treatment, there was nothing to show which came from England or from Canada, nor was it possible to guess correctly, as it proved, as to the authors of the others.

"On examining the drawings, it appeared, what was perhaps to be expected, that those with a single nave, without aisles, seemed on the whole best to meet the purposes of Mrs. Kelly's bequest and the conditions of the site. It was also plain that the designs which contemplated the enlargement and completion of the east end of the Cathedral were, other things being equal, much to be preferred. Of those which fulfilled these conditions, Mr. Mathews's scheme was clearly the best, both from the simplicity and elegance of its plan and from the character of the external treatment and the admirable way in which its outlines combined with those of the Cathedral itself, a point to which attention had been directed in the instructions. The large way in which the Cathedral and chapel were made to open up together was also a point in its favor, though this was a point to which some of the other competitors had paid special attention. These considerations seemed to me conclusive, and I had no hesitation in accepting and confirming this judgment. On referring to the memorandum which Archbishop Corrigan had made, it was satisfactory to find that Mr. Mathews's design was one of those which he had specially approved.

"I am instructed to thank the competitors for the personal interest which they have evidently taken in the work, for without it the drawings could hardly have reached so uniform and so unusual an excellence as they exhibit."

[The following named illustrations may be found by reference to our advertising pages.]

THE AGRICULTURAL BUILDING: PAN-AMERICAN EXPOSITION, BUFFALO, N. Y.

METALWORK,—X: NO. 22 WEST 20TH ST., NEW YORK, N. Y.

[Additional Illustrations in the International Edition.]

HOUSE NO. 7 WEST 56TH STREET, NEW YORK, N. Y. MR. J. H. DUNCAN, ARCHITECT, NEW YORK, N. Y.

[Gelatine Print.]

ENTRANCE TO THE OLD CASTLE, MILTENBERG-ON-THE-MAIN, GERMANY.

[Gelatine Print.]

THERE are few stretches of country containing as many odd and picturesque little towns as the district in Southwestern Germany called Franconia. Not yet invaded by the noisy locomotive, nor yet dotted with mills and factory-buildings, these little towns, frequently hemmed in their expansion between mountain-sides and streams, have preserved their mediæval, romantic character from the levelling influence of progressing civilization to such a degree that they afford an ample and most attractive field for his researches to the student, as well as valuable models to architect and artisan.

A charming bit from one of these Franconian towns (such as would have delighted the heart of John Ruskin, the hater of railroads and modern improvements) is shown in our plate. It represents the arched entrance-gate, whence leads a hilly path up to Miltenberg Castle, in Unterfranken, Bavaria, about thirty miles west of Würzburg. The old castle, perched high upon the hill above the town-houses, used to serve as a hunting-castle for the Electors of Mayence, to whom it has belonged since A. D. 986. To architects, the two houses flanking the archway on the right hand, in half-timbered construction, with their exquisitely quaint façades and high gables, should prove especially attractive. Over the cellar-archway of the taller one is inscribed the number 1594, probably the date of the origin of the two houses. The fact that these buildings dating from so late an epoch show so pronounced a mediæval character cannot surprise the student when he considers how tenaciously the builders in the Franconian country clung to the Gothic style, a locality noted for a most peculiar amalgamation of Gothic and Renaissance, called the "Julius" style, which flourished during the first quarter of the seventeenth century.

The wealth of timber of the country, together with the circum-

stance that the State furnished the timber free to the citizens who wanted it for building-operations, was undoubtedly favorable to the general adoption of the style of construction we encounter in these pretty house-fronts.

The tall building with the cosy-looking oriel enlivening its front contains (so we are told by a sign) a sewing-machine and bicycle-shop, a rather rude anachronism, reminding the traveller that we stand at the end of the nineteenth century, Franconian backwardness notwithstanding. Would not Ruskin's sensitive soul have been filled with disgust at the sight of this sign! The small house to the left of the archway has a façade decked with bright frescos, such as meet the tourist's gaze frequently in South German towns. These frescos have either been recently renovated, or else are of modern origin altogether.

The Renaissance fountain in the middle of the little square matches the rest of the charming architectural group admirably. It was carved in stone and erected by a Nuremberg guide-master A. D. 1583, costing 703 florins, or about three hundred dollars, according to the town-archives. It is gratifying to know that the eye of the state-government is watchful regarding the preservation of those splendid old houses and will not permit their being torn down to make room for such ugly modern piles as that visible to the left in our plate.

A COMPETITIVE DESIGN FOR THE LADY CHAPEL OF ST. PATRICK'S CATHEDRAL, NEW YORK, N. Y.: THREE PLATES. MR. GEORGE B. POST, ARCHITECT, NEW YORK, N. Y.



THE SERPENT MOUND TO BE A PARK.—The Serpent Mound, the most famous of the works of the mound-builders of Ohio, is soon to become the property of the Ohio Archeological and Historical Society. Now it is the property of Harvard University. Secretary Randall of the Ohio Society received notification recently that the Trustees of Harvard University had adopted a resolution signifying their willingness to transfer the control of the famous park to the Ohio organization. A deed will be drawn up in a few days. Ten years ago the clubwomen of Boston purchased the property in question for the sum of \$5,000 and presented it to the Peabody Museum, the Trustees of which transferred it to Harvard University. More than \$3,000 has been expended in improvements, but the Eastern institution has reached the conclusion that the park should be under the control of Ohio people. A correspondence was opened with Mr. Randall, who, after ascertaining that the society which he represents has the right to acquire such property, accepted the offer of the Trustees. The conditions of the transfer require the society to maintain the mound and its surroundings as a public park, and to erect a suitable monument or tablet inscribed with the record of the preservation and the transfer of the property.—*Columbus (Ohio) Press-Post.*

MORE TOWNS AWHEEL.—One of the most extraordinary spectacles in the world has recently been witnessed in Mix County, S. D. Six large towns, including Edgerton, Old Platte, Castalia, Academy, Colvin and Jasper, have been torn up by the roots. Every house and business structure in all these towns has been "snaked off" its foundation, mounted on wheels, hitched to twenty-four, and in some instance forty, horse teams and started on the long trek across the prairie toward Platte and Geddes. These are new towns on the line of the Milwaukee Railway, of which the Yankton and Tyndall branch, now in the course of construction, is the first railway-line the county has ever had. When the railway was surveyed, instead of hitting any of the fine towns then in existence, it followed the rich lowlands in the middle of the county. The towns surveyed on the line of the road were named respectively Platte, Geddes, Lake Andes, Wagner and Avon. People living in the old towns have been fighting hard to induce the company to change the route, but, failing in this, they decided to move, bag and baggage, houses, business blocks and all, to the new towns. Within a week where have been villages of from one thousand to two thousand population there will be nothing but a lot of poles in the ground, surrounded by ragged stone foundations. The growth of Platte within a week discounts any fairy tale. All the old buildings from the old town of Platte, many miles away, have been hauled in and set on lots in Main Street. Two churches are in course of erection, and an opera-house was among the structures commenced. Three hundred men and teams are grading the streets. The impression created in the mind of visitors is that somebody has taken a contract to build a city in twenty-four hours. The town-site company reserved the best corner lot in the place for any man who would put up a sixty-room hotel, to be completed within sixty days. A Michigan man accepted the offer by telegraph, and his advance guard is now at work. The hotel is to be of brick and stone, electrically lighted and thoroughly modern. An artesian well, sunk 800 feet deep, is throwing a stream big enough to supply a town of 5,000 people. The immediately available supplies of lumber, stone, brick, steel and building-materials were exhausted recently, and telegrams were rushed everywhere giving orders. In one instance a four-story frame structure 60' x 40' was hauled eleven miles on an ordinary wagon, with the gearing ingeniously arranged, by a forty-horse team. The building will be placed on a foundation in the new town, and the plastered walls were not cracked in transit. Gamblers and other questionable characters have made their appearance in large numbers, but the town has already organized a police force, and there is little disorder.—*Cincinnati Enquirer.*

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SUMMARY:—

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IF, as was alleged, there really has been "a sort of tacit competition in the matter of the public building at Indianapolis between the Supervising Architect's office and the profession at large," we must record the fact that the contest seems to have been decided against the Government office and in favor of the general practitioner, who is to be allowed to compete in limited competition under the Tarsney Act for the designing of this Government building. It is not yet publicly announced who are the architects invited to submit designs, but it is already known who cannot have this chance, for the members of the jury have already been selected, and these men and their partners are, by the terms of the Act, excluded from such competitions. The jury this time, besides Mr. J. K. Taylor, Supervising Architect and member *ex officio* of all such juries, will consist of Mr. Henry Van Brunt, of Kansas City, Mr. D. H. Burnham, of Chicago, Mr. E. B. Green, of Buffalo, and Prof. H. L. Warren, of Boston. If Mr. Taylor is disappointed in finding that he is not to be allowed to design this building, he may take consolation in the knowledge that on his retirement to private practice his name will be found more than once included in lists of those architects invited to submit designs in similar competitions.

THERE is nothing more unmistakable than that there is no popular movement that possesses greater vitality than the general determination to make more of our landscape surroundings than formerly, whether in the way of natural parks and reservations, as in the Metropolitan Park System about Boston and the Rock Creek Park of Washington, or the more formal parks of New York and Chicago, or the pseudo-Italian garden of private ownership. In the promotion of this movement the illustrated newspapers and periodicals are doing excellent work in popularizing the actual achievement of the landscape worker. The admirable illustration of an Italian garden that accompanies Mrs. Wharton's tale in this month's *Scribner's* is an incitement to the private possessor of means, just as the illustrations of the Japanese tea-garden at South Orange, N. J., shown in last Sunday's New York *Tribune* should stimulate officials who have the charge of our public parks; and as these and similar pictures reach all parts of the country, the seed they carry will germinate in all kinds of unexpected places where there happens to be a receptive mind and natural conditions which invite the improving and restraining guidance of the educated hand. It is not possible that the movement should not become one of the most civilizing influences of our time. At present, perhaps more is being done in the northern parts of the country, where climatic conditions are not entirely propitious, but eventually the most attractive

and famous results of the modern art of landscape architecture will be found in California and the isothermal belt that stretches across the country and includes within its northern limit Denver and St. Louis, while its southern limit dips down as low as El Paso before it begins to slant up again to Richmond.

IT is evident, too, that in this work woman not only can but will play an important part. Not only will she desire to have landscape embellishment carried out for her own personal gratification—paid for by her husband or by the municipality she adorns with her presence—but she will desire to do these things with her own hands or at least to control and direct them—be the actual and paid landscape-architect, in short. No sooner did the Massachusetts Institute of Technology and Harvard University announce the establishment of courses in landscape architecture than the authorities found themselves called on to decide whether they should open these courses to the several women who applied for admission. While we do not feel that the calling is one that is peculiarly adapted to woman, we do feel that woman has certain natural gifts which fit her to follow it in some of its branches with pleasure to herself and profit to her employer. Her keen perceptiveness of the beauties of a landscape-view properly set, her love for flowers and plants and the knack of nursing them to a vigorous and natural growth and her general abhorrence of a straight line are natural gifts that fit her to care properly for the surface of things, and if she has a reasonable degree of business instinct she can easily employ trained engineering skill to look after the things beneath the surface, foundations, levels, drains, hydraulic problems, and so on. Already there are several women landscape-architects practising with success; some, like Mrs. M'Crea, of Chicago, having in a manner accidentally succeeded to an established business, and others like Miss Beatrix Jones, of New York, who have elected their vocation and prepared themselves for the work by a thorough course of instruction.

AS if to enforce what we say above of the likelihood that the largest and most effective field for landscape work lies to the south of this latitude comes the announcement of the Agriculture Department of the State of Pennsylvania that it proposes to use all possible means to improve the landscape effects throughout the State, and inviting the coöperation of the various public bodies, forest-wardens, agricultural societies, corporations and private citizens. The most effective and helpful agents will probably be found to be the railroad corporations. The Pennsylvania Railroad Company was, we believe, first to discover that passenger traffic could be encouraged by not only advertising to the world the splendors of the natural scenery through which the road-bed ran, but by heightening the natural interests through beautifying the surroundings of the stations and doing something to remove or, at least, veil the scars in Nature's face, made by the inevitable fills and cuttings. In this way the leaven is spread all through the State and the back-country citizen, forced to loiter at the nearest railroad-station, insensibly derives pleasure and inspiration from the trim surroundings and well-kept flower-beds of the station-grounds and carries home a feeling of discontent with his own unkempt surroundings, which in very many cases is certain to result in his attempting to better them. In these matters example is better than precept, and the smaller and less-wealthy railroads are sure, sooner or later, to follow the example of the Pennsylvania Company, and so establish foci of instruction which cannot but have an inspiring effect on the rising generation.

THE naive criticisms of works of art voiced by the uneducated but practical observer while they are generally amusing often have a real value: the absence of the saddle-girths or the atrophy of the lolling tongue in a mouth that is obviously champing the bit has worried many a countryman as he gazed at some equestrian statue; a cartridge-box or scabbard slung at the wrong side has led many a G. A. R. veteran to cast jibes at the sculptor of some soldiers' monument, and no matter how beautiful the color and how great the painter's technical skill the man bred on the farm will first note that the teamster is driving his ox-team from the wrong side. In London there is a journal published in the interest of

the merchant-tailors, or however they may be styled in England, which each year gravely publishes its appreciations of the portraits exhibited at the Royal Academy, and points out how here a breast-pocket has been introduced or omitted, or three buttons painted in place of four, or the roll of the lapel, or the crease of the trousers is all wrong. The latest instance of practical criticism of this sort comes from the New York Granite Cutters' Union, which has been much perturbed because its assumed rights have been disregarded by the architects and contractors for the new City Prison. As the Union has been debarred from doing the stonework on this building, it is quite sure that the work is all wrong and so has watched the progress of the building with minutest care and has been prolific of formal written complaints forwarded to the mayor. Tired of watching the working and bedding of the stones, it has sought relaxation by observing the architectural and artistic embellishments of the structure, and has at last stopped at gaze before the municipal coat-of-arms carved in the tympanum over the main entrance, and has discovered that it, too, is all wrong. The non-union sculptor and stone-cutter have made hash of the city's seal and have placed the sailor on the side of the escutcheon where the Indian ought to stand, the alleged eagle is not known to American ornithology and, really, the bas-relief, not properly exhibiting the city arms, ought to be taken out and replaced by the proper thing, Union-cut. Doubtless the criticism, being made by practical men who have cut the municipal escutcheon over and over again, is well founded. At the same time, we have seen coats-of-arms on buildings where it was impossible to determine whether the supporter on one side were soldier, sailor, Indian chief or Indian squaw, and perhaps the sculptor in this case may be able to prove that however imperfect may be his ethnical delineation he has not been guilty of a blunder. But the practical man is a very keen critic and artists often fail to satisfy him.

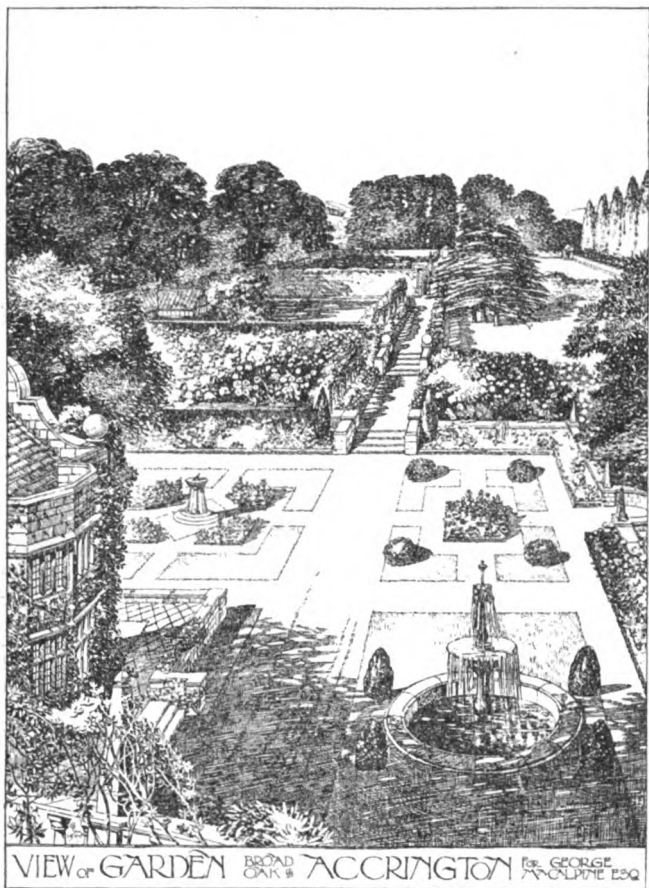
IT does not conduce to sweetness of temper when the victim of an accident finds that his insurance policy, which he supposed gave him protection, is found expressly to forbid him to indulge in that particular form of accident. Nor does it console a citizen whose building has been blown up, or down, or swept out of existence in some way, to know that he has uselessly paid fire-premiums for years. The desirability of having some means of insurance against damage to buildings other than that caused by fire is suggested by the loss we have suffered this week through the bursting at night of a thirty-inch water-main in front of our premises which flooded every cellar in the neighborhood. We would be the last to suggest that any one should undertake to insure buildings against structural weakness, as that would but encourage the careless and unskilful workmanship and design that are now fostered — though to a lessening degree each year — by the fire-insurance companies, but a more common inclusion in the fire policies of existing insurance companies of protection against loss by wind or water, or the formation of new corporations specifically insuring against losses of these kinds is distinctly desirable, and water-damage in one form or another is sufficiently common to make it evident that property-owners would gladly pay for protection and so afford to the insurance companies a reasonable income. The modern laws affecting the employer's liability for accidents happening to his workmen have caused contractors to secure protection in their turn from the accident insurance or guaranty companies, and we believe the business is profitable to the latter. We are uncertain, however, whether these or any other concerns are willing to insure against loss falling upon the fabric of a building in course of construction or upon neighboring structures, through some of the many half-justifiable forms of building accident, such, for instance, as that which happened last week in New York at Broadway and Walker Street, where a steel column, properly placed and secured, was dislodged by the shock of a falling derrick and fell upon and crushed the adjacent building five stories lower down. The owner of the injured building can recover from the contractor, but it seems as if some form of insurance could be devised to give a partial protection to contractors.

THE greater part of the ingenuity and capital spent in inventing and developing automatic fixtures has been wasted, and inventors and promoters have more often achieved loss than profit. The man who invented an automatic feeder

that discharged into the manger at so many hours' interval a stated quantity of grain forget that a horse might sometimes be absent from his stall over two or three feeding-times and on his return would simple gorge himself into a colic. Automatic appliances are only useful, economical and safe when they are not allowed to work automatically, and this obvious truism has lately been impressed on the School Board of Brooklyn on being confronted by the Water Department's statement that the automatic flushing-apparatus in the school-buildings under their jurisdiction were wasting over seven hundred and fifty thousand gallons of water each day. The apparatus installed in the Brooklyn school-houses appears to be a very industrious and hard-working appliance, for, as it appears, they flush closets and urinals at stated intervals day and night and as frequently in vacation time, when schools are closed, as during term time, when the school-rooms are full to overflowing. The School Board is said to be appalled by the discovery of this inexcusable waste and talks of displacing the automatic flushing apparatus with some less wasteful appliance. But, as it is not the apparatus that is at fault, we trust that they will not convict themselves of further folly and waste more of the public funds by changing the system. All automatic flushing-apparatus is already adjustable or can easily be made so, and an automatic apparatus is one of the best that can be used in public schools. The real blunder has probably been in employing janitors who believed that an automatic apparatus was really meant to be left to automatic operation.

THE courts are seemingly inclined to give effect to the late decisions of the highest English and American courts that even peaceable picketing is not to be tolerated by the law. A cigar-maker in New York was fined in the police court last week for picketing, and in a similar case the equity division of the Massachusetts Superior Court issued an injunction which restrains the defendants from "wilfully and maliciously intimidating and preventing persons from remaining or entering the plaintiffs' employ, from interfering with the business of the customers of the plaintiffs if they continue to deal with the plaintiffs, from posting false, malicious and libellous signs, placards and notices of and concerning the plaintiffs and designed to prevent the public and all persons from doing business with them and their customers; and also from distributing handbills and cards, and from driving through the streets of Boston, a wagon on which are false, malicious and libellous signs, and from standing at, near or surrounding the plaintiffs' places of business, and from patrolling in front of the same, as well as from intercepting persons from entering their places." While both these instances afford encouraging signs that there is still hope that the law can protect the peaceable citizen, the New York case is the most hope-inspiring of the two, since it comes from a quarter whence usually proceed signs that the interests of the peaceable citizen do not concern the office-holder charged with the execution of the enacted laws.

A FEW weeks ago an electrical engineer in New York committed suicide because a costly wiring system installed in a steamship proved defective and useless, one report alleging that his own blundering was the responsible cause and another stating that failure was due to malicious mischief on the part of a discharged subordinate. At any rate, the unfortunate suicide was evidently endowed with a conscience, and it is a pity that a man so endowed should deprive the world of his work, when there are so many conscienceless workers left to do their mischief. "Transformer defective" is the brief and rather cynical statement appended as the explanation in the case of several fatal accidents reported for the last quarter by the Electrical Bureau of the National Board of Fire-underwriters, and it strikes us that it is a pity that those who manufactured, installed or tested these defective transformers had not the tender conscience of the New York engineer. Perhaps they are so endowed and are now bearing the conscious burden of a blood-guiltiness that their greater care might have avoided. A man once convicted of carelessness ought no longer to be employed on electrical work, since the fatal effects of his blundering are less apt to be visited upon himself than upon innocent parties guilty of no improper use of the installed apparatus. Besides mere carelessness and sheer ignorance, it is not impossible that malice is a prolific cause of electrical fires, and fires now supposed to be due to merely accidental short-circuiting may in reality be due to incendiary purpose.

NOTES ON SOME EUROPEAN SYSTEMS OF FOREST ADMINISTRATION.¹—V.From *Building News*.

THE name of Professor E. Landolt is not only inseparably associated with the modern development of forestry in Switzerland but is distinguished among those of the first authorities on scientific forestry throughout the world.

Preliminary to a survey of the present status of Swiss laws on forestry and the method of their administration, it may be well to glance at the growth of conditions which have brought about the present practice. The facts are succinctly set forth in a report by Professor Landolt on the group "Forestry, Game and Fisheries," at the Schweizerische Landesausstellung, Zürich, 1883.

As the compass of these notes does not afford space for a translation *in extenso* of the Professor's admirable monograph, the chief points of it only will be here transcribed, with this general acknowledgment of indebtedness to his work.²

The use of the forests began as soon as men settled in or near them. There was no forestry in those early days, for nothing was sown or planted, nothing cared for, and men simply took what they needed from the seemingly inexhaustible stores of the forest.

Strange that these conditions of a primitive civilization in the Alpenland survive in our time and land, in a nation which so prides itself upon its advancement.

Who thins the wood, reasoned the early Swiss, adds to his pasture, and who destroys an edge of the forest and prepares the ground to produce food, not only furthers his own good, but is a benefactor to his fellow-men. And so he went on cutting and uprooting until he had so far lessened the mass of the forest that he began to have a dread of wood-famine. This came about earlier in the thickly-peopled places, in the lowlands and on the hillside, than in the savage wilds of the mountains, whose stony slopes were, indeed, only fit for trees to grow: earlier where wood-consuming industries were in working than where simple tillage was followed, and first of all, naturally, in great places far from large forest areas. With scarcity of wood for building and fuel becoming actual, or at least in sight, the leaders and the people turned their attention to the forest.

The first ordinances were aimed rather at economy of material than increase of production, and sought to make easier the supply of the poorly-wooded parts from the heavily-timbered regions.

Limitation of such use of the by-products of the woodland as interfered with replanting razed areas, or endangered conservation, was the outcome of a much later experience. In this stage the forest began to be valued on account of its steady yield of timber, not, as formerly, solely for the chase and to be used without check; property rights in woodland were defined and trespass forbidden; the boundaries of forest-areas were established; and utilization was regularly controlled.

As it began to be understood that the forest was not alone a boon

to man in its products, but a protection, as well, against the enemy and disasters of Nature's working, certain parts were set under special ward and reserved, without as yet, however, a definite scheme of culture. Then came the conviction that to merely protect the forests from overuse was not enough to secure a supply of timber equal to the demand, and to maintain their defensive status, but that steps must be taken for the renewal of regions in part or wholly denuded, and to protect the growth.

With this knowledge—that the forests needed not only guarding but rebuilding and cultivation as well—came the demand for capable forest-workers, and later for forest officials under the control of the legislative and executive authorities; and thus gradually developed an organized forest administration. This business of caring for the forests very soon brought comprehension of the fact that they performed other functions in Nature's housekeeping than the supply of necessary timber and the shelter of certain places from the avalanche and stone-chute, and taught the importance of the forests to agriculture in a way which won many friends to the cause, and made welcome the establishment of control over their use and of careful culture even in the most remote mountain-lands. The beginning of the fourteenth century saw the birth of that dread of wood-famine which has come down through the centuries to our own time. Consumption was limited, export forbidden entirely, or allowed only under a high tariff. The damaging use of by-products, grazing, etc., was checked.

The city of Zürich forbade her *Vorstern* to cut, raft and sell wood from the Sihlwald, not only from reasons of economy but to limit the authority of those officials.

Schwyz, in 1339, interdicted charcoal-burning in her forests, and Freiburg, in 1438, prohibited the cutting of wood in her environs. The statute-book of 1471 forbids cutting in the high forest-belt.

Bern issued in 1592 an edict for economy in wood-consumption and for the protection of the forest against overcutting.

Such like prohibitions and regulations were reissued from time to time as, in spite of them, the supply of material continued to diminish in forests near the centres of consumption.

Various schemes were devised to promote economy. The right of the *eigener Rauch*, the house-fire, was curtailed, fuel-sparing appliances were recommended,—the old *Thonofen* or *Kachelofen*, tile-stove, still in use to-day, is probably the most economical heating-stove ever invented; wood was taxed and the extension of wood-consuming industries discouraged.

Some of these ordinances were even inimical to certain cultures: Zürich prohibited in 1563 the planting of new vineyards, on the ground of their using up a good deal of wood, and this ordinance was reissued from time to time, carrying heavy penalties, up to the beginning of the eighteenth century, when it last took the form of forbidding the use of unsplit vine-stakes.

The embargo on export of wood was in force not only on the national and cantonal frontiers, but also from place to place in the interior, and continued partly in operation up to the dissolution of the Confederation in 1848. As transport difficulties, however, minimized the traffic in timber, these export regulations had, up to the opening of the eighteenth century, scarcely more than local bearing. The tendency to observe such restrictions, becoming general about that time, had grown into strength toward the middle of this century, when the control of the export traffic was pretty widely accepted as a necessary safeguard against over-use of the forests.

Damage to the forests from woodland-pasturing and resin-scraping was early recognized, but the injurious effect of excessive raking of litter was for a long time unnoticed.

Zürich forbade pasturage in the cutting-areas as early as 1376, and the Sihlwald was entirely closed to the herds in 1417.

Freiburg, in 1435, forbade sheep-grazing in the forest, and in 1489 the statute-book limited all forest-grazing to a period of three weeks, and prohibited the driving-out of goats without a goat-herd.

Appenzell decreed, in 1539, that the owner of goats was responsible for their depredations and, in 1708, the shooting of predatory goats was justified.

Canton Zürich prohibited the grazing of cattle on old or new cuttings.

Glarus, in 1620, prohibited goats browsing unguarded.

Canton Vaud regulated the resin trade in 1675, while in 1670 Zürich deliberated upon its entire suppression.

In 1711, Neuenberg prohibited injury to the forest from leaf-raking, but elsewhere there was no regulation of that matter until near the end of the eighteenth century.

Thus there was a great deal of special legislation throughout Switzerland designed to protect the forests from abuse of the pasturage, but all of these ordinances were far from being effectively enforced. The development of conditions of ownership in Switzerland was peculiar. The early extinction of the land-fiefs in greater part, the unusual amount of independence enjoyed by the communes in the ordering of their internal affairs, the unequal authority of the governing powers, the various character of settlements and the existence of large areas in the mountain-districts unsuited for cultivation and for private ownership, were factors in the building-up of property relations.

The absence of manorial estates and the jealousy with which the communes guarded their separate rights would account for the scarcity of State forests in Switzerland. The present State forests were nearly all bought up, taken from great estates, or confiscated from the monasteries. These State properties are mostly in regions

¹ Continued from No. 1271, page 38.

² "Bericht über die Gruppen 27-28: Forstwirtschaft, Jagd und Fischerei." El. Landolt, Professor. Zürich, Verlag von Orell Füssli & Co. 1884.

where the important and ambitious towns of the olden time held broad sway, or where rich monasteries have been extinguished, the State in these latter cases always considering itself heir to the monasterial forests. They lie, therefore, in the old "Land Bern," in the Bernese Jura, in Schaffhausen and Thurgau.

The public forests of the Cantons Uri, Schwyz and Solothurn form a link between State and communal forests. The Government controls their use by the several communes in interest, apportioning the rights of each, and changing such apportionment when it sees fit to do so. This system has, of late, been given up in Solothurn, where the forests are now definitely apportioned among the communes, but it is still in working in the two other cantons.

Canton Lucerne once claimed sovereign ownership of all great forests, *Hochwaldungen*, within her borders, but in 1514 they were conveyed by statute to the communes for a yearly consideration of "12 mäss [about three hundred and sixty pounds] of good cheese." Where the inhabitants engaged in agriculture built their dwellings together, thus early creating villages and setting up communal entity, the communal forests flourished, for in these places wood and pasture were used in common; but, where, on the contrary, there were separate farms and no proper villages, each settler claiming ownership of the land about his farmstead, there was no community of interest, and the private forest resulted. The first condition is found in the plain and hill country, where lay large contiguous bodies of cultivable land, as in the Jura region, for example; the second is found in the foot-hills of the great ranges, where land fit for clearing must be sought here and there, and where the assembling of groups of families was not so possible. Early in the present century the original proprietary status was disadvantageously disturbed by the apportionment of many communal forests among the parties in interest.

The proper delimitation of forests followed the recognition of their value to agriculture and was, doubtless, brought about and much furthered as a result of increasing disputes over proprietary rights and their extension; but while we find in the history of the town-forests of Zürich, as early as 1491, discussion as to patrolling and remarking of bounds, and in the statute-book provision for the determination of public and private forest-lands in 1442, the marking out of many mountain forest-areas is not completed to-day.

The setting apart of reserve forests — *Bannwaldungen* — was determined on various grounds: protection of the frontiers, supply of especial needs and those of the larger communes, securing against over-use those forests convenient for export of timber, protection against avalanches, stonefall, torrents and the degradation of the mountain-pastures, etc. The reservation frequently held in force for a few years only. While the placing of forests in reserve originated mainly with local authorities for the conservation of important local interests, such power was, also, in all times exercised by the governments. The most ancient of these acts relate to the protection of boundaries. As early as the year 1339, Schwyz forbade cutting and clearing in the Wehri forests along the frontier and ordered the latter marked out. In 1424, Schwyz ordered the protection of the oaks.

Similar regulations are found throughout the fifteenth century, for the care of certain species and for the reserve of whole forests, and we find these repeated in later times. Forest reserve for protection against avalanches, landslips, etc., first appear in national legislation, however, in the beginning of the eighteenth century. Uri set apart "*Dorfbannwälder*" (village reserve-woods) and "*Mattenbannwälder*" (meadow reserve-woods) for the protection of the villages and meadows below them, also "magisterial reserves" to supply timber for the public buildings. Schwyz, in certain cases, prohibited injurious litter-raking. High penalties were set for infringements of the "reserve" laws. Each inhabitant was bound upon his oath to report transgressors. *Bannwarte* (reserve-guards) were placed to watch the interdicted forests. These were, very likely, the early forest-guardians. Their title has survived in that of "*Bannwart*," applied locally to foresters.

Under intelligent administration regularization of supply took the place of absolute reservation.

For the town of Zürich's forest, the Sihlwald, it was determined, in 1384, that cutting, begun on the under border, should proceed regularly upward year by year. In 1442, the cutting allowed was 20,000 "*Holz*"; in 1495 it was 12,000; in 1533 it reached 27,000, and 30,000 in 1547.

The exploitation of the other "town-woods" was also fixed on a basis to prevent overcutting and damage. After the "*Etat*," or output, of the Sihlwald had been gradually increased to 40,000 *Holz* annually, a commission of experts found, in 1581, that the forest was overcut and must rest for an indefinite period.

The municipal administration did not content itself with fixing the amount of cutting and superintending the use of the forest, but further looked out that the manner of lumbering should be suited to the conditions and favorable to proper care of the standing trees. Among fourteenth-century records we find "notices" and "resolutions," providing clear cuttings and thinnings (*Durchforstungen*) in regular rotation.

At the end of the sixteenth century the Sihlwald's yearly yield was set at about one thousand *Klafter* (the *Klafter* measuring 2 cubic metres).

At the end of the seventeenth century, during whose course the forest-product was systematically harvested, the forest was remeasured and the increase estimated. On the basis of this the annual

cutting was regulated at about twelve hundred *Klafter* of prime and five or six hundred *Klafter* of inferior material, among which was included fagots or "*Wittfrauenholz*" (widow's-wood). This regulation is still in force, with some extension of culture dating from 1737, in essential features. Similar conditions, doubtless, existed in other forests which came under intelligent control, but, in the main, the development of a systematized forest-culture came but slowly.

State-forest regulations of the seventeenth century were limited almost without exception to the preservation and protection of the forests, and rulings of broader effect seem to have received little attention.

In the eighteenth century, however, the domain of forest science was greatly enriched and the development of forest laws advanced with long strides.

Zürich, Bern, Freiburg and Lucerne were to the fore in this advance. The Physical Society, of Zürich, and the Economic Society, of Bern, busied themselves with a study of forest conditions, and in search of means for their improvement, whose results form the basis of subsequent forest legislation. New and more stringent ordinances were promulgated by the several State governments as they succeeded to power, and the hands of the executive were strengthened. Careful inspections of the forests were instituted, foresters assigned and cultures established under their conduct, some experiments were made at introducing exotic species, forest surveys and mappings and reports were pushed forward, and a thrifty use of forest products was enforced.

The wars of the early part of the nineteenth century were not encouraging to forestry. Law-givers were otherwise engaged and the forest was neglected. The first third of the century was not, however, quite barren of good to the cause of forestry.

The settled Cantons revised their old laws and made new ones. Forest-grading was abolished, more guards appointed, surveys carried out and efforts to establish regular working-plans were made with success. The State and larger communal forests instituted cultures and thinnings, and generally brought the woodland into condition for better forestry. Even the mountain Cantons were beginning to think of correcting abuses. The Helvetic Government accepted the care and maintenance of the forests, but the times were unpropitious. The forests suffered considerable damage during the political disturbances.

Zürich published in 1807 a new forest system; and Solothurn set up a course of instruction in 1809 in forest management, survey, etc., with appointments to the post of under-forester for the six best men taking the course. Solothurn adopted a general forest system in this year, as well as the Canton Neuenberg under Prince Berthier.

Zug, in 1821, provided for scientific regeneration of degraded lands. There was much activity in forest matters in 1830, and the connection of floods with the denudation of the mountains becoming more generally accepted by the people, there awoke a general interest in forestry matters.

Increase in the number of guards and advance in the standard of their training were the chief results. New legislation effected a strengthening of the administrative department. As the forest-owners, their representatives and the people generally became enlightened upon forest science and forest values, forestry throughout the most of Switzerland made good progress.

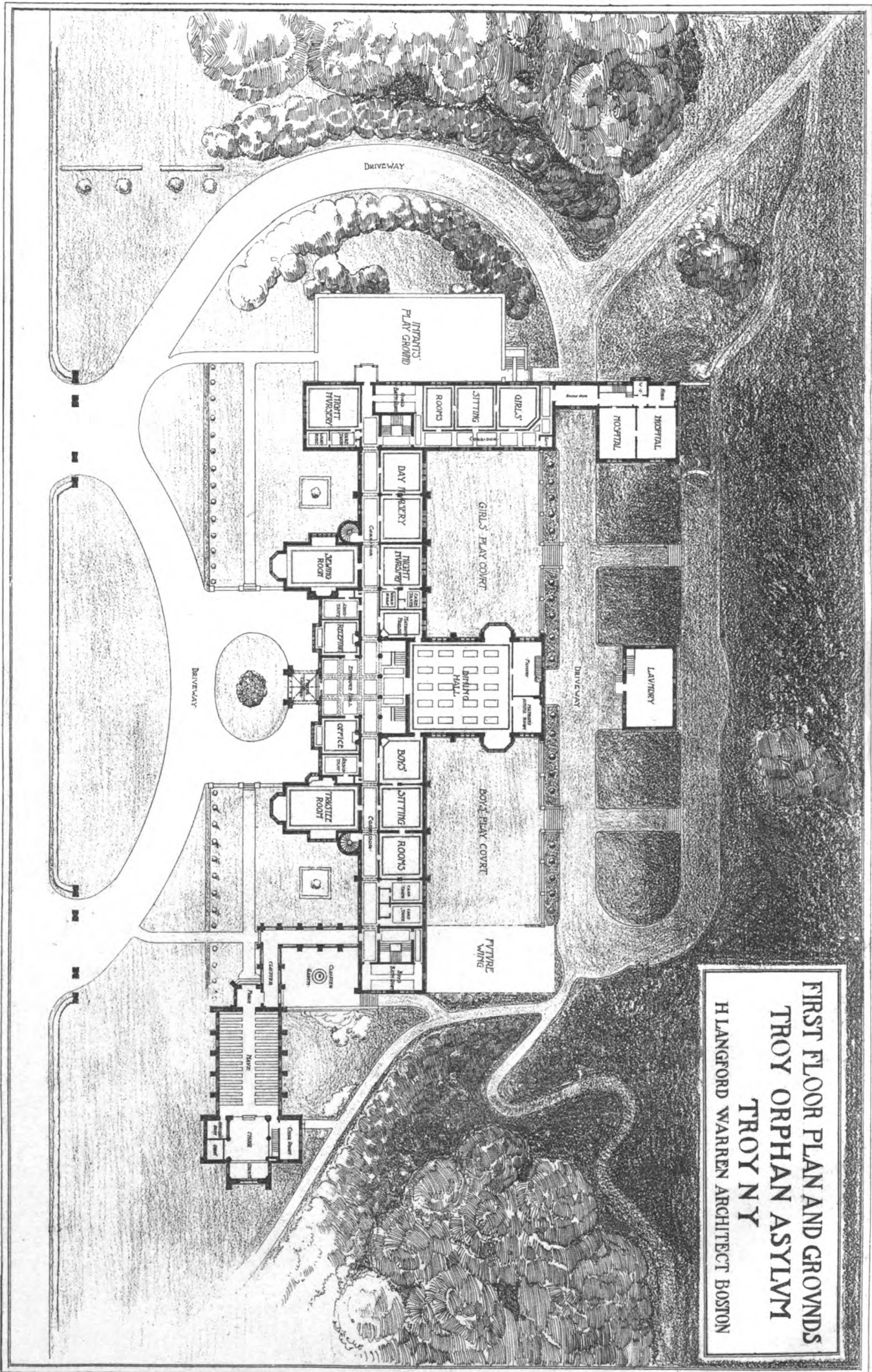
The people, always jealous of their liberties, were become reconciled to the intervention of the State foresters, being convinced of their usefulness and the necessity for them. Certain Cantons of peculiarly democratic constitution made no steps forward, however, but rejected the laws for the national improvement of forestry, holding on to old systems and to the right of control of their own properties with great obstinacy.

The growing appreciation of the economic importance of the forests, in the maintenance of the soil on the steeper slopes, in their conservation of a permanent water-supply in the springs, brooks and rivers, and their effect on conditions of weather and climate, among other things, together with the rapidly-rising prices of wood, made the establishment of a systematic forestry in the recalcitrant mountain Cantons more and more desirable.

The Confederation finally took the matter in hand as one of national interest. The Swiss School of Forestry was founded in 1855. In 1858, an investigation into the mountain forests and torrents was carried through. The efforts of the *Forstverein* had already done good work on the redemption of torrential streams and the afforestation of their sources. The law of March 24, 1876, finally affirmed the right of the Confederation to a higher control of the forest police in the high mountains. This brought all the mountain Cantons under the forest regulations and officers, with the result that an improved condition has been reached which promises in the course of a few years to give the mountain forests of Switzerland a permanently productive status.

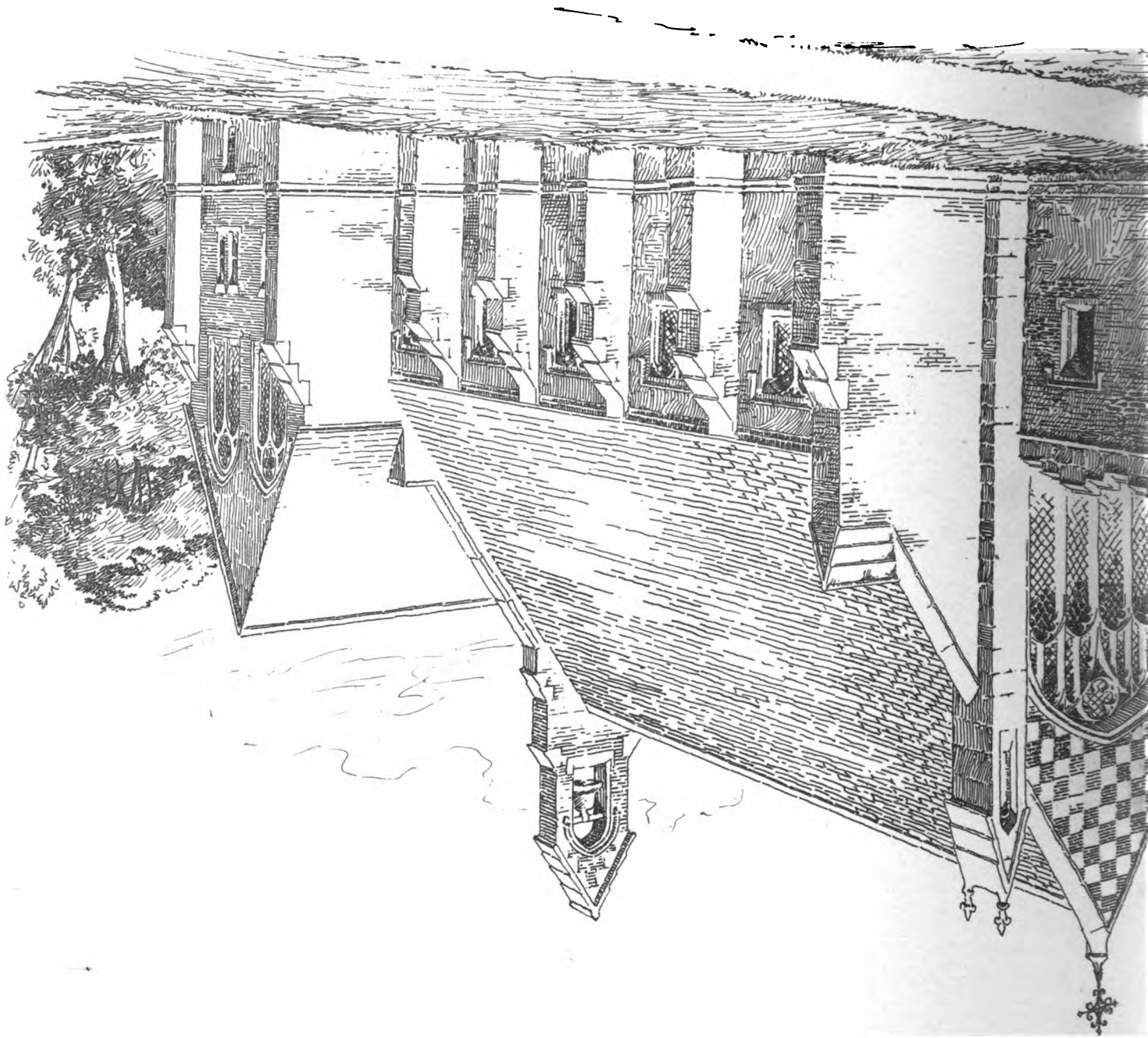
Forest-guards, especially for the reserve-forests, were of early origin under the various titles of *Bannwarte*, *Holzwarder*, *Vorster*, etc.; "*Vorstern*" in the Sihlwald appear in the records of the year 1314. Higher authority over the forests and their use and for the punishment of trespassers was exercised by the councillors, stewards and functionaries. The Council of Zürich turned over these duties to a single one of their number in 1342. These were the first forest officers. But only toward the end of the eighteenth century were forest officers regularly appointed by the State. No especial knowledge was at first expected of them, only general intelligence in

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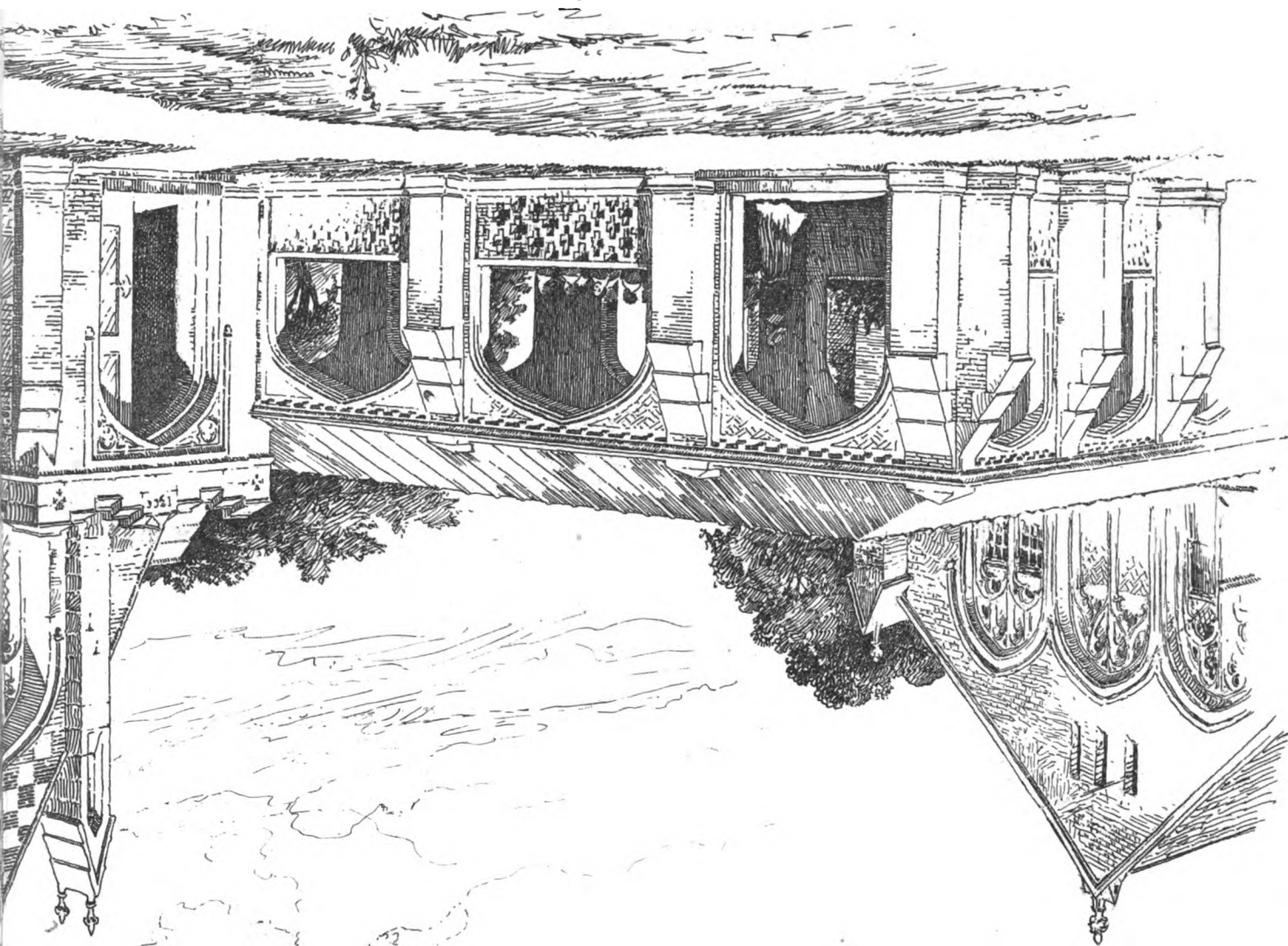


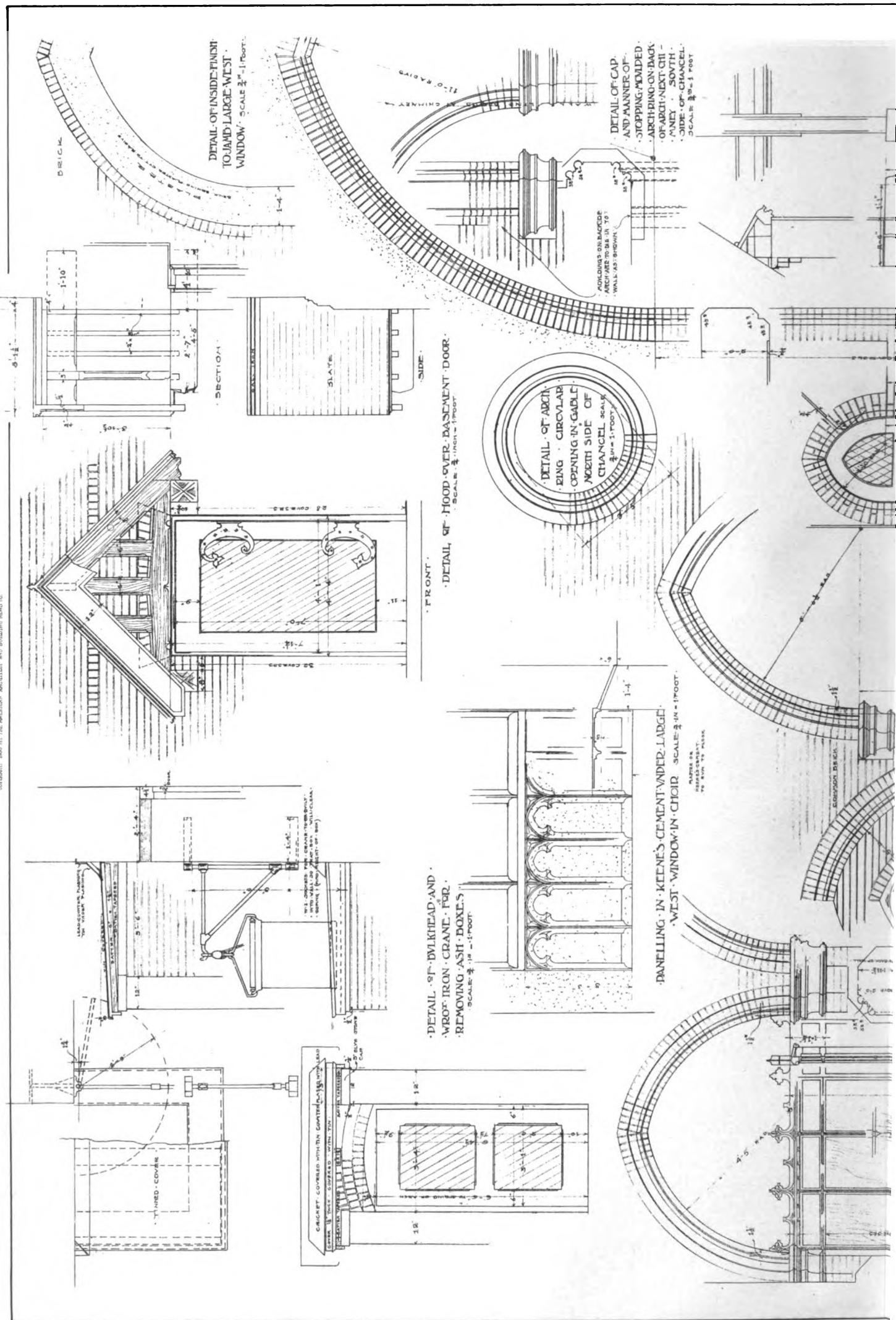
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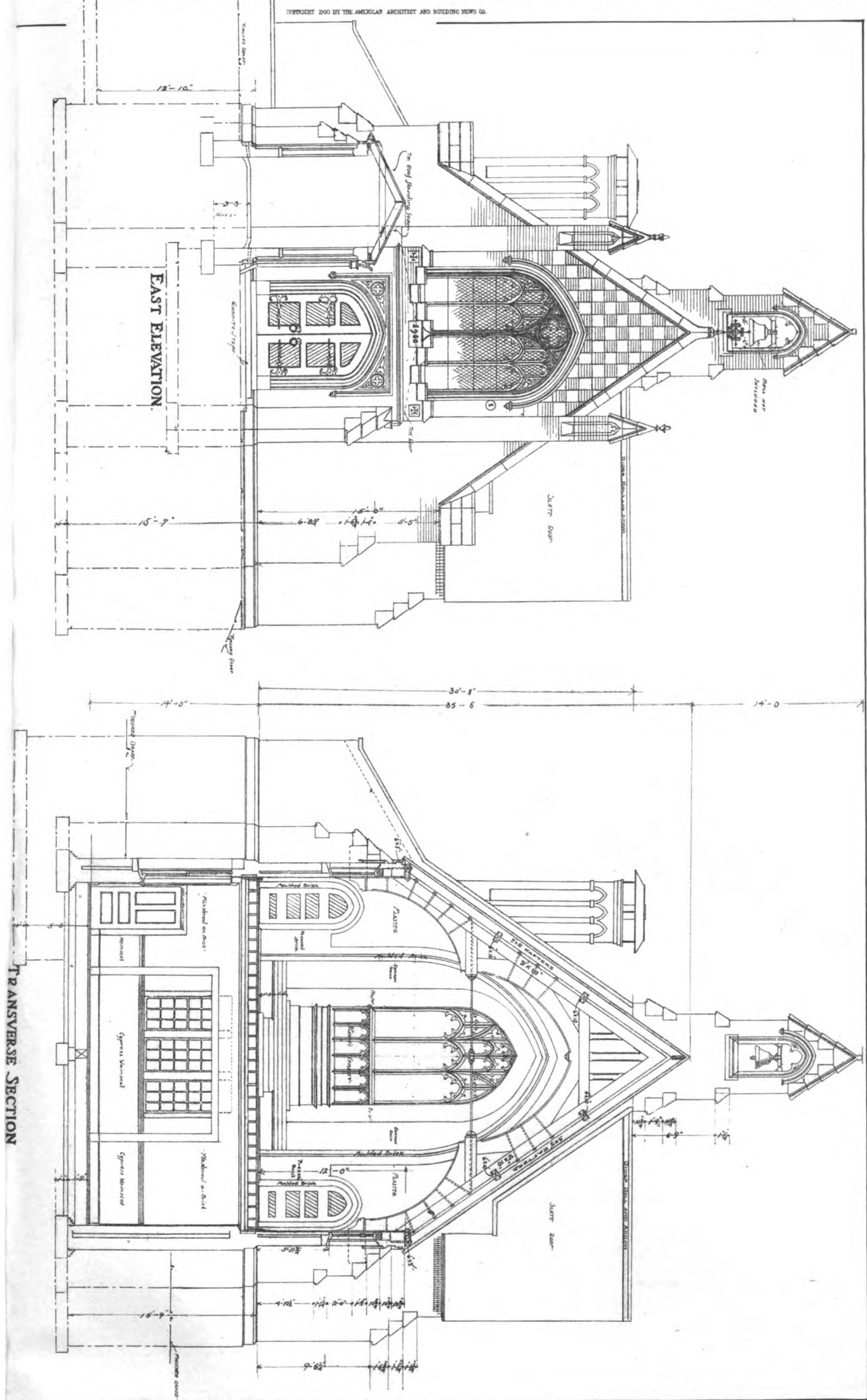


NEW CHAPEL FOR THE TROY
WARREN, SMITH & I





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wood-lore and some practical experience. These requirements were gradually broadened. In the absence of a home school before 1855, Swiss foresters studied in the neighboring German schools of forestry.

The strong national objection to increase of officialism has urged certain Cantons to try to get along without properly trained foresters, but this has failed and must be changed.

Switzerland, then, to quote Professor Landolt's closing paragraph more nearly in his own words, "has not yet everywhere a quite satisfactorily regulated forestry, and far less does she enjoy throughout a good condition of her forests, but she has laid the foundation for a better ordering of the forest status and for improvement in the culture and use of the forests."

A. B. BIBB.



THE PRESENT CONDITION OF THE BUILDING - STRIKE. - PROFESSOR DESPRADALLE'S DESIGN FOR A MONUMENT IN JACKSON PARK. - THE RELICS OF THE

WORLD'S FAIR STILL EXTANT. - THE DRAINAGE-CANAL.

AS usual, we begin this letter as we have every one written from Chicago for nearly nine months: "Matters connected with the labor trouble are still quite unsettled." Way back last October the contractors were avoiding new work, preparing to get ready for this tremendous strike, which began in its actual activity in February. The effect upon Chicago can easily be imagined, not only in building circles and real-estate interests, but in many other ways which bring activity and prosperity to a city. The twenty-eighth of June one of our leading papers opened its labor column with this paragraph: "The bricklayers and the contractors signed a peace pact yesterday that makes certain the collapse of the Building Trades' Council within a week, and the resumption of the building industry in Chicago on a basis which guarantees prosperity to the workmen and the investors." It further adds, "Notice of the withdrawal of the strong organization of the bricklayers and stonemasons was served upon the Executive Committee of the Building Trades' Council yesterday morning by President George P. Gubbins. It created consternation among the reckless leaders, who have kept 60,000 men in idleness and large numbers of families in want."

More than a month has now passed since the date of this publication, and still the strike lives and flourishes, though certainly it is a hopeful sign that such withdrawals have been made and bodes well for a settlement that will be more advantageous for both workman and contractor. The contractors are standing well together, and the outcome is not to be distinctly prophesied. Some fear that there will be no actual settlement, but that the laborers will gradually creep back to work and the question of the rights of the unions will be held unsettled in the background for a while, only to be brought up again with renewed vigor next spring, when, perhaps, the contractors are not so well able to fight them, but when at least the men have reinforced themselves by work all winter. One would suppose that the men's resources would be nearly exhausted after such a long time of enforced idleness. To be sure, many of them get small jobs, or perhaps settled work outside their own trade, but the man who is accustomed to earning three or four dollars a day is now only earning a dollar and a quarter or a dollar and a half, which, if he is a man with a family, is but a pittance. The outside unions have sent help, but large as these sums have been they are only a drop in the bucket when you consider how many people are eager for help. It is reported the man with savings has had, of course, to use them, and, in case of his owning a small house, has had to mortgage it to raise money, as the unions could not help any one still possessing property to fall back on. To say that architectural interests in Chicago are quiet but mildly expresses the situation. The pessimists, mostly the older men, declare it is that death which knows no awakening, or at least an awakening in the generation to which they belong. Even Chicago's indomitable spirit and desire for planning big things seems for the time to have disappeared, and there are but few castles in the air waiting to be materialized in brick and mortar on our streets.

Marshall Field has purchased the old Central Music Hall, and there is a scheme, doubtless to be realized in the near future, of covering the entire block of that State Street frontage with one large store. Mandel Brothers, who never dare to be much behind Marshall Field, have leased for ninety-nine years the old McClurg site on Wabash Avenue, which will give them an entire block's frontage on Madison Street, with extended frontage on Wabash and State Streets. They will erect a nine-story structure, the plans for which have been prepared by Holabird & Roche. The debris from the burned McClurg building is now being cleared away by non-union men.

It is rather amusing to see when Chicago is not in a position to dream dreams of greatness, actual greatness, "the biggest thing that was ever built," how outsiders take up the matter. Now it is Professor Despradelle, a teacher in the Massachusetts Institute

of Technology, who sends us from Paris this summer a dream on paper of a memorial which we shall erect as a reminder of our glorious "White City," on the spot which it has made famous. It is said Professor Despradelle submitted his plans to the Architectural Department of the Paris Salon this year. The jury awarded him the first medal of honor, and the French Government purchased a set of the drawings for the National Gallery of the Luxembourg, where they will remain permanently on exhibition." The chief feature of the design is a tower 1,500 feet high. The paper from which the above quotation was made further adds: "Should the American people accept this gift of the best fruits of his genius from the great Frenchman, Chicago will have a new wonder of the world, beside which the labyrinth and pyramids of antiquity and even the Coliseum itself, will be made commonplace." What a pity we cannot accept it. It is suggested in the course of the article that it be placed on the site of the German Building at Jackson Park. It would seem a pity to destroy this really charming old German reminder when there are acres and acres of unoccupied ground fit for the site of a "Memorial." The German Building at the Fair, which it is to be remembered was of a considerably more substantial character than some of the other government buildings, still stands amidst its willow-grove, by the shores of the Lake, and it looks as if its first ten years would only bring an added grace to it. It is well kept up as a sort of restaurant or refectory and is a very charming feature in the park. Go there at the close of a lovely July day, when the low sun's rays are warming its brilliantly colored tile roof, and the park is quiet, with all the gay world gone to Paris to see this year's wonder, and all the commonplace world gone home to bed or to its supper, you will find this a truly charming bit of architecture, more appreciated now than it was in the midst of all the charms of seven years ago, and so pure in its old German feeling as to bring up all sorts of pleasing dreams of far-off Germany, the Germany of the Middle Ages, with singing friars, and golden-haired maidens peering from the windows of its graceful turrets.

There is really a good bit of interest left in Jackson Park even if you don't drive a golf-ball over the links, which are all bunkers in places, or a horse over its smooth roads. The Art Building, as every one knows, still stands there, now transformed into the Field Columbian Museum, and holds a goodly collection, anthropological, natural history, etc., for those who care for miles of such things. Nothing has been done to the building, not even a coat of white paint, it would seem, and in spite of its good lines the beauty is fast going. It is a pity it could not be kept up, if allowed to stand at all, for it might be a fine feature in the park for years to come. Under its projecting wing, beneath a canopy rests the old Viking ship, probably as part of the transportation exhibit which is inside. It seems a mistake that the old caravels could not be treated as well. They are now rotting in the lagoon, bearing the sign, "Danger - keep off," surrounded by the charred walls of what used to be the banks of the Court of Honor. Take a little launch from the boat-landing, in itself a very charming little composition built since the Fair, at the close of a summer day, at that hour when the garishness of sunlight has departed, and you will find much of beauty still in this once beautiful spot. The Art Building, seen through green vistas, is not without attractiveness, the German Building rises distinctly picturesque from its grove of willows, and you sweep past the "Wooded Islands," where still stand the little Japanese palaces, on the exterior as attractive as ever, but now only visited by the innumerable birds which haunt this really quiet corner of a busy city, and surrounded by roses, which in June make the spot an objective point for pilgrimages. Drifting quietly down through the lagoon you encircle the old caravels, three pitiful old crafts in picturesque decay, and catch a glimpse beyond them of distant Rabida, now used for a fresh-air hospital for Chicago's poor children. This building is well preserved, but hopelessly lessened in picturesque effect by having been painted a spruce-gum brown instead of its appropriate white. Beyond this loom up two atrocious figures, which seem to defy the "tooth of time," and which stood in the neighborhood of the Krupp-gun exhibition, while rising mysteriously out of the desert at your left, you puzzle your brain over a double flight of stairs which lead nowhere, forgetting the "intermural" and that there was a station here at the south end of the Court of Honor. These seem to have escaped the kindly hand of fire which spread over this part of the park, leaving desolation to be sure, but not undignified absurdity.

One of Chicago's great works, before mentioned in these letters, has this last month been officially accepted. We refer to that of the drainage-canal. We all know around this part of the country, or know we have known, how much it cost, how deep it is, how long it is, how many years it took to build it, but not till one has taken a journey down its length does one in any way appreciate the tremendous work. On board one of the little steamers bound for Lockport, thirty miles down the canal, where are situated the first controlling-works, the surprise begins as one sits and waits for the time of starting on the Chicago River and breathes in no noxious odors, such as used to make one hurry across the bridge in former days. The water, which is unobjectionable in the river, grows more pure as it flows, till at Lockport it is a beautiful sheet when it takes its wild plunge over the dam into the channel of the sluggish Desplaines River, to flow onward into the Illinois and to be checked at Joliet again by controlling-works. These works are huge "bear-trap" dams, which by being raised can lessen the flow of water on the rivers below Lockport in case of spring freshets, or can control the current

up in the Chicago River. The need to do this was exemplified the other day, when one of the large Lake steamers got turned across stream, entirely obstructing the river. Her own weight and the current of the stream made it impossible for the little tugs to pull her back, and it was only in the course of twenty-four hours after the current had been stopped at Lockport that she was swung around. From a picturesque side this great engineering feat is not without its charm. First, one passes between low, gray banks fringed with the brightest of green vegetation, the canal stretching away and behind one as one looks out at the stern of the little steamer, with an occasional old cantilever derrick rising from the banks, simulating a wind-mill, and on a white, gray day one thinks nothing is so like Holland this side of it. Then one passes through the rock cuts and discovers on either side huge piles of excavated material in fantastic shapes, or great pyramidal forms, and it's the desolation of an Egyptian desert or Elihu Vedder's "Last Man." These huge piles of stone mean future building-material and rubble for the surrounding neighborhood and a vast amount of money for the owners.

At this period of enforced idleness, when few permits are being issued at the headquarters of the city building department, there has opportunely occurred a bad fire at No. 125 Dearborn Street in which several lives were lost, owing to the deplorable condition of the building and the lack of all accommodations in the way of fire-escapes. This is stirring up a considerable amount of talk, very properly, for the state of many of the down-town stores and factory buildings is certainly something which requires prompt attention.

THE USE OF ACETYLENE IN ISOLATED PLANTS.¹

THE question of lighting isolated plants has, until lately, been one of the most difficult to deal with, on account of the inadaptability of the several sources of light for this purpose. It is conceded that lighting with oil or kerosene lamps is insufficient in brilliancy and obnoxious on account of the smell, and, therefore, in all cases where gas from a central station at a reasonable price was not to be had, the choice of lighting has generally been a system of arc-lights or incandescent-lights, or a mixture of both. A great many railway-stations require less than fifty lights. In order to provide for that number of lights the cost of an electric-light plant would be excessive, always taking into consideration that no direct connection with an existing system of electric-lighting can be made. Even when renting electric-light from a corporation or a private individual, the cost, as a rule, has been high enough to make it preferable to endure the inconveniences and semi-darkness of kerosene lamps instead.

In the last few years, however, a new light, which seems to be admirably adapted for the purpose of lighting isolated plants, has made its way slowly and steadily to the front. This new source of lighting is the much-slandered king of all illuminants, — namely, acetylene. The great ease with which this gas can be manufactured and the small cost at which it can be installed have emboldened many to place on the market apparatus which has been the means of delaying the ultimate success which this gas, in spite of all objections, is bound to gain for itself.

Given a piece of carbide, two tin cans and some water in which to throw the carbide, and you will have gas as pure as it is made with most of the modern apparatus.

The composition and properties of acetylene have been little understood, even by those who made it a business to build apparatus for its generation.

To the engineer who wishes to familiarize himself with the practical and salient points of this gas, its adaptability for certain service, its danger, etc., time is generally not given to take up a lengthy study in order to make himself acquainted with its chemical and physical properties. With this fact in view, some of the most important properties of acetylene will be mentioned. The greater part of the information to be given has been taken from the admirable lecture of Professor Lewes, the famous expert, whose lectures were published in full in the *Progressive Age*.

Acetylene-gas has been known since 1836, when Mr. Edmund Davy produced this gas and called it bicarbonate of hydrogen. He was the first to make public its splendid qualities as an artificial illuminant, and predicted that it would take the lead of all if it could be produced cheaply enough. As the carbide which he used for generating this gas was a combination of rather expensive materials, it is easily understood that from that time on little had been done or heard regarding acetylene as a lighting medium, and it is due to the invention of Mr. Wilson, who in 1892 found a commercially successful product in calcium carbide, that this gas could be produced at such a price as to enable it to enter in competition with other sources of lighting.

Calcium carbide is now made by fusing 100 parts of lime and 70 parts of coke in an electric-furnace. The material used for the manufacture of carbide must be of great purity; the lime should contain, on an average, 99 per cent of CaO , and the coke should not run over 5 per cent of ashes. The lime and the coke are crushed to nut size, then ground to powder in mills, and finally screened. The materials are then weighed and mixed; the latter process is con-

tinued for at least five minutes for the sake of uniformity. The mixture is then introduced into the electric-furnace and fused under the electric-arc. When cold and broken into pieces, carbide has the appearance of granite, and is equal to it in hardness. A temperature of $2,700^{\circ}\text{C}$. is required for its formation. As carbide absorbs moisture from the air very greedily, it must be protected, in transit as well as in storage, from the influence of the atmosphere. It is, therefore, shipped in air-tight packages, and, when kept above ground in a dry place, there is absolutely no danger connected with its storage.

Carbide, manufactured as above, is an almost pure product. For manufacturing purposes, one mechanical horse-power is required for a yearly output of 1.1 tons of carbide.

Carbide is sold at present, in carload lots, at \$68 per ton, with strong indications of a reduction in this price as soon as rival capital shall compete in this field.

The most objectionable impurity in carbide is magnesium, which, while melting, takes up nitrogen from the air and forms magnesium nitrate. Such carbide, when in contact with water, gives out a gas rich in ammonia, which, if not washed out of the gas, will clog up gas-pipes and burners and produce smoking.

Berthelot first made definitely known the true composition of acetylene as 92.3 carbon and 7.7 hydrogen, with a density of .92. If carbide is placed in contact with a small quantity of water it will not generate pure acetylene-gas, as the heat developed by its generation will allow the acetylene to polymerize, and the result will be a gas rich in benzene, naphthalene and other polymers, which lower the candle-power of the gas and cause it to vary with each instant, as the lighting, under such circumstances, is done with benzene-vapor instead of acetylene-gas.

Acetylene is colorless, and when pure and dry it has a special, not entirely disagreeable, smell, as it is neither acrid nor corrosive; when hot and moist, however, the odor changes, as it contains then the products of polymerization.

The temperature of inflammation of acetylene is about 400°C ., and its temperature of combustion about $2,000^{\circ}\text{C}$. It, therefore, has nearly two and one-half times greater heat of combustion than illuminating-gas per cubic foot, but for equal amounts of light it gives out very much less heat than illuminating-gas. It needs twelve and one-half volumes of air for its complete combustion. The fear of acetylene as a poisonous gas was dispelled several years ago, as it has been conclusively shown by very extensive experiments that its toxic qualities are less than those of coal-gas. There has been a universal belief that this gas attacks metals, and especially copper, and forms with them explosible combinations; and even so learned a man as Professor Lewes mentioned in one of his lectures that, on account of this property, copper must not enter into the construction of an acetylene-gas generator, only to declare a few months later, after hearing of the Pintsch Gas Company's experiments, that his position with regard to the use of copper and brass in connection with acetylene-gas had been erroneous. In the summer of 1895 the Pintsch Gas Company made the following experiments, in order to throw light on this vexed question: They filled several steel tanks with acetylene at a pressure of 150 pounds per square inch, and placed in these tanks numerous articles made of nickel, brass and copper, and exposed these tanks on the roof of a building during nearly an entire year to the extreme heat of the summer and the severe cold of the winter. After opening these vessels it was found that none of the metals had been attacked by pure acetylene-gas, and that even in some tanks where unpurified gas had been stored only oxidation had taken place. In no case was it possible, by either pressure, or hammering or heating, or a combination of these methods, to produce explosion.

Bullier, the French scientist, suspended copper plates, freed from surface oxidation, in acetylene for a period of one year, at the end of which time the copper was found to be as bright as on the day it was put in. The valves of the acetylene apparatus in his laboratory, which were also made of copper, showed absolutely no sign of having been attacked by acetylene after two years' service. Since these experiments were made we have ourselves observed generators with copper parts and also brass pipes used in chandeliers, which, after more than two years' of service, have shown no signs of being in the slightest affected by the gas.

Acetylene-gas becomes liquid under about 700 pounds per square inch of pressure at ordinary temperature. At 37°C ., which is the critical point for acetylene-gas, it requires a pressure of 1,000 pounds per square inch to liquefy it. When this temperature is passed no pressure will convert it into a liquid state.

Acetylene-gas, when heated to $1,432^{\circ}\text{Fahr}$., will dissociate, and, when not compressed to more than 30 pounds per square inch, the dissociation is confined to the point where the heat is applied, and thus no explosion occurs. When, however, it is subjected to a pressure of more than 30 pounds and heated to the dissociating point, a violent explosion follows, resulting in the destruction of the confining receiver. Acetylene-gas not compressed cannot be exploded by shock, heat or concussion. A pipe leading from a gasometer filled with acetylene-gas was heated to a white heat about five feet from the gasometer, and, while local dissociation of the gas at the heated point took place, no explosion could be produced. The shock of a bullet shot through a tank filled with 150 pounds compressed acetylene-gas also failed to produce an explosion. The crushing of a receiver, filled with acetylene-gas compressed to 150

¹ A portion of a paper by A. Lipschutz read before the Civil Engineers' Society of St. Paul, March 5, 1900, and published in the *Journal of the Association of Engineering Societies*.

pounds, under a ram weighing 600 pounds and falling 20 feet, produced neither explosion nor ignition.

Acetylene, like every other combustible gas, forms, with air, an explosive mixture, and a room or building containing an acetylene-gas generator must be well ventilated, in order to allow for a proper exit of gas leaking from the generator.

As already stated, acetylene has a great density, and a receiver, such as a gas-bell, for instance, open on top, will retain gas several days if the gas is not blown out by a current of air. Hence no repairs, requiring soldering or heat, should be attempted at an acetylene-gas generator until all traces of gas have been expelled from the apparatus.

Non-observance of the two rules just stated has been the cause of nearly all acetylene-gas explosions in practice.

As the carbide commercially manufactured is never chemically pure, it introduces impurities in the gas, of which the principal ones are ammonia, phosphuretted hydrogen and sulphuretted hydrogen. It is due to the two last-mentioned impurities that acetylene-gas has a disagreeable garlic-like smell, which disappears whenever these impurities are removed. With very few exceptions, chemical purification of acetylene-gas has thus far not been resorted to in this country, for which the following reasons might be briefly stated:—

The commercial carbide, as furnished to consumers in the United States, is of greater purity than the similar article in Europe. A second and probably more valid reason is that very few attempts have been made in this country to burn acetylene with mantles as in incandescent gas-lighting; in which case it has been found that the organic sulphur and phosphor compounds of the unpurified gas would break down the mantles, thus making a chemical purification of this gas compulsory. Besides washing the gas free of ammonia, which is now done in connection with nearly all modern generators, the elimination of other impurities might be accomplished by three different processes, — viz, (1) passing the gas through chromic acid, (2) the use of bleaching powders and (3) the application of acid copper salts.

A comparison of the different qualities of rays given out by the several light sources is stated as follows:—

Coal-gas gives out a weak light, with yellow rays; destroys colors, heats the air and has strong toxic qualities. It is weak in diffusive power.

Electric arc-light has pale, sickly, violet rays, but is very intense. It is, however, the least diffusive of all lights, and is therefore rapidly being supplanted by other and more diffusive lights.

Incandescent electric-light has reddish rays, mixed with yellow, and is fatiguing to the retina, but gives out little heat.

Incandescent gas-light is too often rich in greenish rays.

Acetylene gives pure white rays; does not change colors; is least fatiguing to the retina; has but slight toxic qualities, and, being the most diffusive of all lights known, approaches most nearly sunlight. It has eleven times greater illuminating power than coal-gas.

When carbide is placed in contact with water, gas is immediately generated.

The different ways in which these two substances may be brought together have given rise to an apparently countless number of generators, all of which, however, may be classified under three different methods of generating this gas, namely:—

1. Water drips or flows to the carbide.
2. Water rises to the carbide from below.
3. Carbide is dropped or thrown into a large body of water.

The generators of the first system are mostly used for small experimental and portable apparatus, such as headlights and bicycle-lamps. The high temperature of generation incident to bringing a comparatively large quantity of carbide together with a small quantity of water results in the product of a heated, and therefore impure, gas, for which reason such apparatus is unsuitable for any large installation. In another construction of this type of generator water flows through a pipe onto the carbide, which is stored in a receptacle, which in its turn is connected with a gasometer. When gas is generated the bell in the gasometer rises, and when in its highest position closes a valve in the water-pipe, thus stopping further generation of gas.

Still another form of generator has a closed carbide receptacle immersed in a tank of water, and a water-supply pipe leading from the carbide receptacle into the tank. Water pours in through this pipe and onto the carbide, until the pressure of the gas rises sufficiently to drive back or hold back the water in the supply-pipe.

This type of generator has, besides the above-mentioned defects, the disadvantage that, in the absence of an especially large gasometer, the generation of gas, after the water-supply is cut off, may raise the pressure in the pipes and generator to a dangerous degree.

In the generator mentioned, sticking of the water-valve or failure of the levers or other means for opening this valve may also result in a dangerous rise of pressure.

Generators of the second system are constructed on the following principle: In a tank filled with water is inserted a bell, free to move up and down on guides. The carbide receptacle is hung inside of the bell, and when the bell is in its lowest position water flows through holes or sieves in the bottom of the carbide receiver. Gas is instantly generated, and its pressure raises the bell, and with it the carbide receiver, thus lifting the carbide-supply away from the water and stopping further generation.

There are in use numerous modifications of this method, of which

one may be mentioned in which the carbide remains stationary, while the water-surface is acted upon by the gas-pressure, alternately rising to and receding from the carbide, according to the demands of the machine.

This entire class of generators is open to the same objection as the class first considered. They also continue to generate gas when water is removed from the carbide.

The third class of generators operates by throwing or dropping a small charge of carbide into a closed tank filled with water. The gas thus generated bubbles through the water, and is led to a gasometer which is large enough to accommodate the amount of gas which the small charge produces.

The charge introduced in the generator falls on a grating, and, being surrounded by a large mass of water on all sides, generation takes place with but little rise in temperature. The gas, by rising in bubbles to the surface of the water, is washed, and contains only traces of ammonia.

With gas produced by this class of generators it is impossible to stop up pipes and burners, as the ammonia and other tar-forming ingredients have been washed out of the gas by its upward passage through the water. From such a generator, which has been in active use part of the day, evenings and nights for over two years, we have taken out pipes close to the generator, and also some near the burners, but all that could be found was some white spots like frost, due to lime being carried with the gas from the generator, and nearly all along the pipes the original scale of the iron was to be seen; and in the brass pipes of the chandeliers we could find no deposits or signs that the metal had been affected.

Such testimony has been corroborated by other disinterested parties in this country and Europe to such a degree as to make it advisable to consider for use in our plans only apparatus constructed on the third principle, — namely, that by which small charges of carbide are introduced by hand or automatically into a large body of water.

It is fully realized that a large amount of capital is invested in the manufacture of apparatus of the first and second systems, and the abandonment of these classes of generators will therefore be made unwillingly and slowly; but the future belongs, without doubt, solely to the generators of the third system.

As the charging and cleaning of generators are the only items of expense for labor connected with an acetylene-gas installation, it becomes of importance that, with automatic machines, such as are used in smaller installations, a rather large machine be used. For instance, in a plant requiring fifty lights for three hours daily the consumption of gas would be approximately 90 cubic feet per day, necessitating a generator capable of holding 18 pounds of carbide. As there is generally, in a passenger-station or freight-depot, a man to be found whose duties will permit him to spend an hour in charging and cleaning the machine, it will be seen at once that a generator holding, for instance, 54 pounds of carbide would require attention only about twice a week for a couple of hours, and such attention can be given without seriously interfering with the attendant's other duties.

The limit in size for an automatic machine is reached in a generator capable of holding a charge of 100 pounds of carbide. This would supply practically 150 lights for three hours. When an installation requires more than 200 lights it would appear best to use a machine charged by hand, and employ an attendant for the sole purpose of taking care of the plant.

This is by far the safest and most satisfactory way of generating, and there is no doubt that for all larger installations, and also for village and town plants, such a system, with a hand-fed generator in connection with a liberally proportioned gas-holder and a proper system of piping, will prove more economical and less liable to accidents than an installation with a number of automatic machines.

As before stated, there is at present in the market no generator which delivers a thoroughly dry gas, and it becomes therefore of the utmost importance, in piping for acetylene, to follow out the rule that all pipes must dip from the burner back to the generator, in order to free themselves from moisture and condensation, which otherwise will surely freeze up in the pipes and prevent the gas from reaching the burners.

It is self-evident that the generator-room must be kept moderately warm all the year round, in order to prevent the water in the generator from freezing. There is no danger from the proximity of a stove or heater. The charging and cleaning of the generator is to be done by daylight, and no artificial light must be permitted in the generator-room when the machine is open, as, for instance, in charging.

A burner consuming 1 foot of acetylene-gas per hour will yield from 45 to 50 candle-power, whereby it will be understood that the piping for acetylene can be of much smaller size than for coal-gas. It is, however, not advisable to use a smaller size than $\frac{3}{4}$ -inch pipe. Common burner-cocks, such as are used for ordinary illuminating-gas, answer very well.

With reference to burners, it must be stated that good burners are still very expensive. Cheap burners are an everlasting source of trouble, and necessitate constant renewals. The only burner which has been found to work satisfactorily with acetylene-gas is constructed on the following principle: The gas, before issuing from the burner, is divided into two tiny streams, so diverted as to form between them an angle of about 90°. These streams impinge on

each other, flatten out and form the flame, which is here not in direct contact with the burner, and thus an accumulation of carbon at the burner and a stopping up of the gas-hole is prevented.

All-lava burners are preferable to metallic burners with lava tips, although, if proper care is taken when applying the latter, good service can be had from them also. While we have burners under observation which, after two years' service, are still in good condition, it is not safe to figure the life of an average burner as more than one year. They should be tested before applying, for capacity as well as for efficiency, as it is not an uncommon occurrence to find in a gross of burners 10 per cent unfit for use.

Before concluding this part of the paper, given over to a description of the use of acetylene for station lighting, it may be of interest to have some details of a plant in practice.

The Great Northern Railway has at Hamline a freight transfer house, which consists of a warehouse about 800 feet in length, having loading platforms at each side for the entire length of the building. The offices are located at one end of the structure. There are altogether about 100 burners, of which 26 are in the office, while the rest of them are grouped in three rows; one row being in the centre of the freight-house, and the other two rows on the platforms. The generator is installed in a small building about 20 feet distant, which also serves as a dinner-room for the men. The office-lights burn all night, while the lights in the freight-house and platforms are needed for about four hours daily in the winter. The generator is a 100-pound carbide machine, and is charged every-other day. The cost per lamp-hour (22 candle-power) varies from .55 cent to .65 cent, according to the amount of gas used. This includes attendance, depreciation and renewals.

Formerly the lighting was done with kerosene lamps. Aside from the fact that it required the exclusive services of more than one man to fill, trim and clean 100 oil-lamps daily, the light furnished by these lamps was found to be insufficient to do the required work. The light furnished by the acetylene plant has reduced the cost per ton of freight handled, and no other system of lighting could be installed at that place which would rival it in economy.

We have now a number of passenger-stations and freight-depots equipped with acetylene plants in operation, and several others under construction, ranging from 20 to 60 lights each, and in no case has an acetylene plant been decided upon except where, by its smaller operating-cost, its independence of rented sources of light and its fine illuminating qualities, it has shown itself to be superior to other systems of lighting.



[Contributors of drawings are requested to send also plans and a full and adequate description of the buildings, including a statement of cost.]

FIRST-FLOOR PLAN OF TROY ORPHAN ASYLUM, TROY, N. Y.
PROF. H. LANGFORD WARREN, ARCHITECT, BOSTON, MASS.

Views of this group were published in our issue for March 10, last.

NEW CHAPEL FOR THE TROY ORPHAN ASYLUM, TROY, N. Y.
MESSRS. WARREN SMITH & BRISCOE, ARCHITECTS, BOSTON, MASS.

EAST ELEVATION AND CROSS-SECTION OF THE SAME.

DETAILS OF THE SAME.

[The following named illustrations may be found by reference to our advertising pages.]

THE ALEXANDER III BRIDGE, PARIS, FRANCE.

This plate is copied from *La Construction Moderne*.

THE NEW YORK "BOX-STOOP,"—XVII: NO. 27 W. 81ST. ST., NEW YORK, N. Y.

[Additional Illustrations in the International Edition.]

A CORNER OF THE FORE-COURT: TROY ORPHAN ASYLUM, TROY, N. Y. PROF. H. LANGFORD WARREN, ARCHITECT, BOSTON, MASS.

[Gelatine Print.]

N. E. WING AND ENTRANCE TO INFANTS' PLAYGROUND: TROY ORPHAN ASYLUM, TROY, N. Y.

[Gelatine Print.]

DETAILS OF NEW CHAPEL FOR THE TROY ORPHAN ASYLUM, TROY, N. Y. MESSRS. WARREN SMITH & BRISCOE, ARCHITECTS, BOSTON, MASS.

STORE AND APARTMENT-HOUSE, AUE, SAXONY.

[Gelatine Print.]

AUE is a small mining and manufacturing town in the Saxon Erzgebirge, not far from Zwickau, and having a population of less than ten thousand. Yet it appears to share the general prosperity of most German cities of the present day, judging from the character of the building shown in our plate, which stands in the busiest quarter of the town. It was erected in 1897 from plans of Herr Albert Gessner, a Berlin architect, containing, besides several stores on the ground floor, one fine apartment each in the second and third stories and two smaller ones in the fourth story, besides some rooms in the attic. The main stairway is reached from the vaulted driveway leading to the courtyard. Over a base of dark-gray granite from Bavaria rises the façade in a fine yellow sandstone from Cotta, Saxony. Timber framework in the gable as well as the columns of the bay-windows in the top story are carved oak. The roof is covered with tiles of a reddish-brown color. The sculptured details were modelled by Herr Riegelmann, of Berlin.

The total cost of the building, which is a credit to the little town, including the low-pressure steam-heating plant, is but \$30,000, this being equivalent to \$9.81 per square foot of covered area, or 15 cents per cubic foot of enclosed space.

HOUSES OF REST FOR DISCHARGED SOLDIERS, BISLEY, ENG.
MR. E. O. SACHS, ARCHITECT.



DANTE'S REMAINS. — After many wanderings, the remains of Dante are preserved in a case in the National Central Library of Florence. Signor Chilovi, the head of this institution, has in mind to give the precious relic a fitting monumental place in the contemplated new library building, where a Dante gallery will be provided. A Deputy, Giuseppe Pescetti, looking to this end, commissioned the sculptor, Prof. Rinaldo Barbetti, to make a design for an urn, which was duly offered last month to Signor Chilovi. The librarian, however, felt under obligations to prefer a design made by the sculptor, Enrico Pazzi, in 1899, on occasion of turning over to the Library the bones which had been in his custody since 1865. This "splendida opera," Signor Chilovi trusts, may be duly executed by the authorities. — *N. Y. Evening Post*.

THE PANORAMA OF THE BATTLE OF CHAMPIGNY. — The history of the panorama of "The Battle of Champigny" by Alphonse de Neuville and Edouard Detaille illustrates the vicissitudes of military painting. After a run in Paris, there came a time when the exhibition no longer paid, and the owners determined to cut up the canvas and sell the groups separately. Some of these fragments have been disposed of in this country. But there was one part of the composition in which the work of the two painters and the action of the figures were so intermingled and interdependent as to be inseparable. This remnant, probably the central scene of the panorama, was exhibited in several French towns, and was finally pawned at the Mont de Piété. It is now predicted that this scene will be bought by the city of Paris and hung in one of the large rooms in the City-hall. In the meanwhile it is being exhibited in "Old Paris." — *Boston Transcript*.

CLASSIFICATION OF FIRE-LOSSES. — Destruction of dwellings, boarding-houses, etc., represents, according to the *Chronicle* tables, over 46 per cent of the number of buildings burned in the United States last year. The tables show that the fire-loss in this country since 1874 has been \$2,738,784,212, and the insurance-losses \$1,605,382,243. Last year the loss was more than one hundred and fifty-three million dollars, or twenty-two million dollars in excess of the loss reported in 1898. Since the record for the last six months shows a greater fire-loss than occurred during the first half of the previous year, the total waste this year is likely to exceed one hundred and seventy-five million dollars, which will mean a disastrous experience for many of the insurance companies. The tables give a review of last year's fire-waste, the principal classes of risks burned, losses in each State and Territory, summary of losses by causes, list of principal fires, and other interesting details.

HOW SANDWICH ISLAND SANDALWOOD WAS EXHAUSTED. — Speaking of the original J. J. Astor, a book-reviewer in the *New York Times* writes that he bought a ship, freighted her with an assorted cargo, and dispatched her upon a new voyage. On her way out she stopped at the Sandwich Islands to take in water and provisions, and at the same time took on board a large stock of firewood. When the ship arrived at Canton, a mandarin came on board and, noticing this wood, asked its price. The Captain told him to make a bid, thinking it about the value of ordinary cordwood. The mandarin bid \$500 a ton. It was sandalwood. For seventeen years thereafter Mr. Astor's ships had the monopoly of the trade in that valuable substance, the secret of its source being guarded with the utmost care. No other firm in the United States or England possessed any knowledge of it till a shrewd Boston ship-owner detailed a vessel to follow one of Mr. Astor's ships, and observe the events of the voyage. The secret was thus discovered, and thereafter Boston enjoyed a share of the sandalwood trade, which was finally open to all comers, and the island-source of its supply soon exhausted.

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THE Annual Convention of the American Institute of Architects will be held this year later in the season than ever, as it will not be held until December, the precise date not yet being announced, and in Washington, according to the now established custom of holding the even-year conventions in that city. The object in deferring the date to a season when the days are nearing their shortest and out-door conditions are more than likely to be unfavorable to those excursions which have always been attractive features of these annual occasions is, that the meeting may be held at the time when the capital city is celebrating the one hundredth anniversary of its foundation. If the postponement were only for the sake of enabling visitors to see and enjoy what there is enjoyable in an American city *en fête*, the delay would seem to us needless and regrettable, but the Institute's convention committee hope that by holding the convention at this particular time, and when Congress, too, is in session, some effect may be had upon two or three very important matters that are likely to be under official consideration at that time, and largely occupying public and private attention. These matters are the remodelling of the White House, the adoption of a plan for the improving of the city, the proper grouping of Federal buildings, and the approach to the Potomac Memorial Bridge. With these special matters in view, the committee is preparing to be as helpful as possible by providing papers which deal with landscape architecture and the treatment of the urban plan, and will gather an exhibition of drawings which will have a bearing on these particular topics. Although it can hardly be hoped that Congress will adjourn and attend the Institute meetings *en masse*, it seems more than likely that members of the important committees can be induced to listen to the papers and discussion, and hearken patiently to the explanation of such drawings as may be shown, so that we are disposed to think the scheme an admirably helpful one, and to feel that the members will be glad to forego the social pleasures of out-door excursions for the sake of attempting to do a work of serious usefulness.

THE exigencies of municipal politics or, what is more to the purpose, the personal requirements of party bosses are such that it is altogether likely that the great "Ramapo water steal" may yet be accomplished, and the citizens of New York City be needlessly robbed of a large part of the two hundred million dollars involved in the scheme. But if there is anything that can rouse the public to take an effective stand against this nefarious job it is such letters as that which Mr. Francis C. Moore, President of the Continental Insurance Company, and an American citizen of the highest type, has written to the New York *Tribune*. Turning his attention to the fact that the promoters of the job urge as one of the chief arguments in its support the allegation that more water must be had for the sake of securing an adequate supply for fire-protection, Mr. Moore shows, by figures drawn from the official reports of the Fire Department, the puerility of this particular argument. He shows that in the years '96,

'97 and '98 the annual consumption of water by the Fire Department was almost exactly thirty-five million gallons, and that, almost as exactly, twenty-five per cent of this amount was salt water drawn from the rivers, while in the year '99, although the water used amounted to nearly one hundred million gallons, more than fifty per cent of it was river water. These last figures show not only that a salt-water fire-service might wholly supersede the use of fresh water but that already the fire-boats are effecting a very appreciable economy in the present water-supply. Further than this, Mr. Moore states that the entire annual consumption of fresh and salt water by the Fire Department is less in amount than the domestic consumption by the citizens for *one single day*, a statement which shows clearly that instead of being a main factor in the argument the needs of the Fire Department are one of the least. Brief, direct and simple as Mr. Moore's letter is, we doubt, as he does, whether it will have much effect. The present Water-commissioner is committed to the Ramapo steal and it would be very easy for him to so manipulate the supply, shutting it off here and letting it waste there, as to produce what would seem, to those who have not time or interest to investigate and reason for themselves, like a short and failing supply under present conditions.

ON the other hand, Mr. John R. Freeman, an hydraulic engineer employed as expert adviser by Comptroller Coler, of New York, who seems on the whole to be really opposed to the Ramapo steal, develops some figures which are not altogether reassuring, and largely because of the large amount of what he calls "probable waste, curable and incurable." Deducting this and also the "metered flow" for manufacturing and commercial purposes, which flow amounts to twenty-four gallons a day *per capita*, he arrives at the conclusion that the present system provides for domestic consumption only twelve gallons daily for each inhabitant. Perceiving that these figures must be meaningless to most men, he shows that in Fall River, Mass., where seemingly all water is metered, the use of water amounts to eleven and two-tenths gallons daily for each of the seventy thousand inhabitants. And as this, too, is somewhat meaningless, he shows that the meters used in three hundred and thirty-nine apartment-houses in Boston indicate a daily consumption of over thirty-five gallons for each inhabitant thereof, while in buildings of a similar character in New York it reaches fifty-nine gallons. The main point of interest in his report—that relating to curable and incurable waste—is, unfortunately, vague, and the factor is so large a one that it affects all deductions. Based on observation of the flow from the Central Park reservoir between one and four o'clock in the morning, he reaches the conclusion that this probable waste is at least eighty gallons a day for each inhabitant; then, apparently scared by his own figures, he declares that, as there are no means of definitely determining this waste, it must, at any rate, be "upwards of fifty gallons per inhabitant per day." It seems to us that an expert retained in favor of the Ramapo scheme could hardly have applied a factor-of-safety with more nonchalance.

THE bodily distress that has been caused by the hot spells of the last few weeks must have caused many a man to wonder why the race is so tolerant of a discomfort which human ingenuity should be able to palliate. Heat and light have been brought fairly under control and can now be distributed from central stations and consumed by enough customers to produce a satisfactory income for the owners of the plant, but the distribution of cool, fresh air from a central station, or what would to some degree have the same effect, the abstraction of heat-units at distant points through the operation of a central force, has, until now, eluded solution. The problem is one of the most difficult that can be laid before the man of science, since it contains not only physical but sanitary conditions of the gravest importance. The small electric-fan used as a cooling fan is a great boon to the few within the radius of its action, but as a sanitary agent it is very defective, and there is no great relief in being pelted hour after hour with a stream of the same foul and moisture-laden particles, and the larger power-fans are not much better, although they do help things somewhat, since they do make a real change in the atmosphere, while the small fans may simply stir about the same befouled medium. The few attempts to provide cooled

air by passing it slowly through underground tunnels or galleries, one such attempt having been made in Kansas City some years ago, we believe, have failed, largely because of the difficulty of getting rid of the excess of humidity at times present in the atmosphere, but largely because enough customers could not be found to support the undertaking, for in most towns it is only on few days and at widely scattered and irregular intervals that the excesses of the natural temperature are so great as to lead one to be willing to pay any sum for relief. Perhaps someone may be willing to repeat with city-water, and tell us how it works, the device adopted by a Swiss engineer, who framed his house with pipes and carried through them water from an underground supply which flowed all the year round at an even temperature. The commercial manufacture of liquid air seems to hold out possibilities of relief, and office-workers and householders may some day regularly "take in" buckets of liquid air as they now take in blocks of ice. Until that time, we in the northern cities cannot but wonder how it is that architects and draughtsmen in, say, Atlanta and New Orleans manage to do their work in the summer-time.

THE business of the maker of refrigerating-plants, already a large industry, received, it is said, a great impetus this spring because of the way in which the ice-trust of New York undertook to squeeze consumers, as one of the first results of the attempted extortion was to induce hotel-keepers, provision-dealers and other large consumers of ice to order private refrigerating apparatus of various makes and sizes. The business, already a prosperous one, is likely to be still further benefited because of increasing demand due to the instruction in cold-storage which is to be given at the School of Practical Agriculture and Horticulture at Briarcliff Manor, N. Y., a new course of instruction which is likely to be of great and widespread benefit, as one of the objects is to show how cold-storage plants can be established on the farm and so enable the preservation of perishable fruit and vegetable crops, which now either are allowed to go to waste or are all sent to market at the same time and so produce a glut and decline of price below the income returning-point. We hope the instruction may also cover the ways and means of affording to the hard-working farmer's wife a little physical cooling comfort in the hot August days.

JOKING about the New Jersey mosquito has long been a favorite amusement of the newspaper paragraphers, but a few lines in the New York *Evening Post*, not at all humorous, show that the creature is one to be taken very seriously. These few lines declare, on the authority of Professor Celli, Director of the Hygienic Institute of Rome, that there are now living in the Roman Campagna fifty thousand peasants worse off now than their fathers were in the times of the Roman Empire, for not only are they in a generally starving condition, but for this large population there are only some five hundred houses, some of them mere wigwams in which one hundred and fifty individuals shelter. How far, if at all, the mosquito is responsible for this state of things, we will not presume to guess; but it is beyond question that the condition of these people is due to the miasm of malaria exhaled from these marshy lands, once drained, perhaps, but now dangerous to any human being who even passes over them after sunset. Modern medical science has seemingly made up its mind that malaria, if not caused by, is at least disseminated by the mosquito, and to prove or disprove this assumption two young English physicians have undertaken one of those heroically self-sacrificing tasks of which the success, and the failure no less, have shed so much lustre on a hard-working, tender-hearted, self-sacrificing profession. To determine how far, and in what way, human life can be guarded against malarial infection, these two young doctors, physically in perfect condition, have established themselves in a hut on the edge of a swamp about three miles from Ostia, known to be a particularly deadly spot, and here they propose to stay and pursue their bacteriological study of the disease, and make examination of the insect and reptile life of the place: these things mainly for their distraction, as their main duty is to carry on an experiment *in corpore vili* and to watch for and observe "symptoms," each his own as well as his companion's, and then record the stages of the disease as it develops. Much helpful information is hoped to be secured from this investigation, and it should be much to compensate the risk, since malaria, even when not immediately fatal, is one of those recurrent diseases which sap a man's vitality and make his life unproductive and a burden.

MR. A. LINCOLN HYDE, of Cleveland, Ohio, publishes a little pamphlet on a new decimal system of weights and measures, which has a serious interest. Although the metric system is now prevalent through the greater part of the civilized world, it has great and acknowledged disadvantages. The worst of these is the inconvenient character of the standards. A person of ordinary height, holding one hand in the middle of his breast, can reach with the extremities of the fingers of the other hand a distance of about a yard; and dressmakers often roughly measure goods in this way; while to reach a metre is impossible, and the addition, by the eye, of a little more than three inches to the yard measure is difficult. The foot also, and the inch, although no one now has feet a foot long, or thumbs an inch wide, can be judged with tolerable accuracy, while the centimetre is a difficult standard to keep in the mind. Again, while the quarter or eighth inch is easily judged, and constantly employed, the millimetre is too small for ordinary use, and the substitution of three millimetres for one-eighth of an inch is more complicated, and more likely to lead to mistakes. In the same way with measures of capacity: while a fluid ounce is easily judged by the eye, cubic centimetres are much less readily estimated, and as soon as the standard must be habitually multiplied to reach a quantity of practical utility, an opportunity is afforded for errors. Even in the countries which have used the metric system for a century, many of the old measures still persist, in consequence of their superior convenience. Probably more people still reckon in France by sous than by centimes, for the simple reason that a sou is a current coin, large enough to buy something, while a centime is merely a scientific expression, or, at most, a numismatic curiosity; and, in the country districts, bread and similar commodities are still sold more generally by the livre, or pound, than by the half-kilogramme, which would be nearly the same quantity, but is an awkward thing to speak of. Mr. Hyde, recognizing these advantages of the old standards over the new, proposes to keep one of them, the inch, and multiply and divide it by ten, squaring and cubing it as required. We cannot say that we approve of the nomenclature which he proposes, and think that, in ordinary writing, there would be endless mistakes between "cubids" and "cubiks;" but this is a trifling matter. The main point, of the retention of the inch as a unit, instead of adopting the centimetre, is of great importance to our manufacturers and machinists, whose plant is based on the old standards, and could only be changed at great expense, and it is quite possible that a compromise of this sort may prove of much value.

A CONTRIBUTOR to the *New York Law Journal* has made an inquiry into the present distribution of business in the legal profession which might be paralleled by one made into the manner in which "trade" is divided amongst architects nowadays. He has examined the last calendar of the Supreme Court and finds that less than twelve thousand cases were in the hands of some twenty-two hundred lawyers, nine hundred and twenty-nine of them having but a single case each to his credit, while only a dozen lawyers had as many as five cases each. Of course, these are jury cases and prove nothing as to the magnitude of chamber practice, but the figures have all the air of proving that a very large percentage of lawyers find difficulty in making a living. On the other hand, one firm had six hundred and nineteen cases amongst those entered in the calendar, while other leading firms had large shares in the total amount; but still there were only five firms that had each as many as fifty cases. The explanation lies partly in the fact that the legal practice is changing in this country, the English discrimination between barrister and solicitor becoming more generally observed here, and that the class of lawyers who only plead in court, taking briefs from their brother lawyers who do not, is getting an increasing number of cases and an apparently larger proportion of business. It also lies in part in the growth of the practice of specialization that pervades modern life. It is from this point-of-view that instructive information might be derived by a similar analysis of the building-permits issued in any large city. Such an examination would probably show that a large number of architects had but a permit or two to their credit, and it would probably show that where an architect had a large number of buildings under his charge an explanation could be found in the fact that they were all buildings of a single class, in the erection of which the architect had become a specialist.

THE HORIZONTAL LINES OF THE PARTHENON COMPARED WITH THE SEA HORIZON.

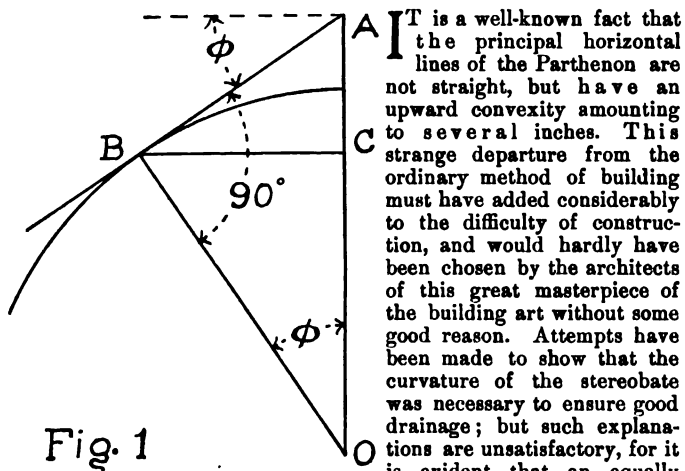


Fig. 1

It is a well-known fact that the principal horizontal lines of the Parthenon are not straight, but have an upward convexity amounting to several inches. This strange departure from the ordinary method of building must have added considerably to the difficulty of construction, and would hardly have been chosen by the architects of this great masterpiece of the building art without some good reason. Attempts have been made to show that the curvature of the stereobate was necessary to ensure good drainage; but such explanations are unsatisfactory, for it is evident that an equally good system of drainage could have been devised without the necessity of using curved lines. To a large number of those who have studied the matter, it has seemed probable that these curves were employed for the purpose of satisfying some highly refined, artistic sense possessed by the ancient Greeks, which modern architects either do not recognize or think it not worth while to consult.

The reason for the upward convexity of the entablature lines under the pediments is doubtless to be found in the desirability of counteracting the optical illusion caused by the slanting lines of the pediments meeting the horizontal lines at an acute angle, such a relation causing a straight horizontal line to appear curved downward. No such theory can, however, be applied to the horizontal lines of the flanks of the temple.

Early in the present century, Dr. Emil Braun advanced the theory that the Greek builders endeavored to make their horizontal lines harmonize with the curve of the sea horizon as seen from the temple; but, so far as the writer knows, Dr. Braun made no attempt to prove the truth of this theory, and the attempt of Penrose to apply Braun's theory to the flank-lines of the Parthenon gave such an unsatisfactory result that the theory seems to have been then abandoned so far as it might have been thought to apply to the lines of this temple.

In the attempt of Penrose and others to test the truth of Braun's

observe how it varies with the point-of-view. From a vessel far out from shore, or from a small island distant from other land, the horizon may be seen as a complete circle; but because our point-of-view is so near the plane of the circle, and we view the line at such an acute angle, a small section of the horizon appears nearly straight. If, however, we could by some means ascend to a considerable height, the curvature of a given arc would appear much increased, and it is possible to conceive of a height where the horizon would appear as a small circle within the limits of a single view.

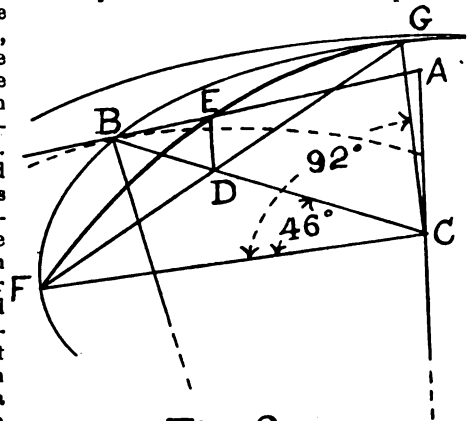


Fig. 2

The sea horizon may be defined as a circle passing through the points where the visual rays from any point-of-view become tangent to the surface of the sea. The radius of the horizon circle for any given point-of-view may be found by means of the following formula:—

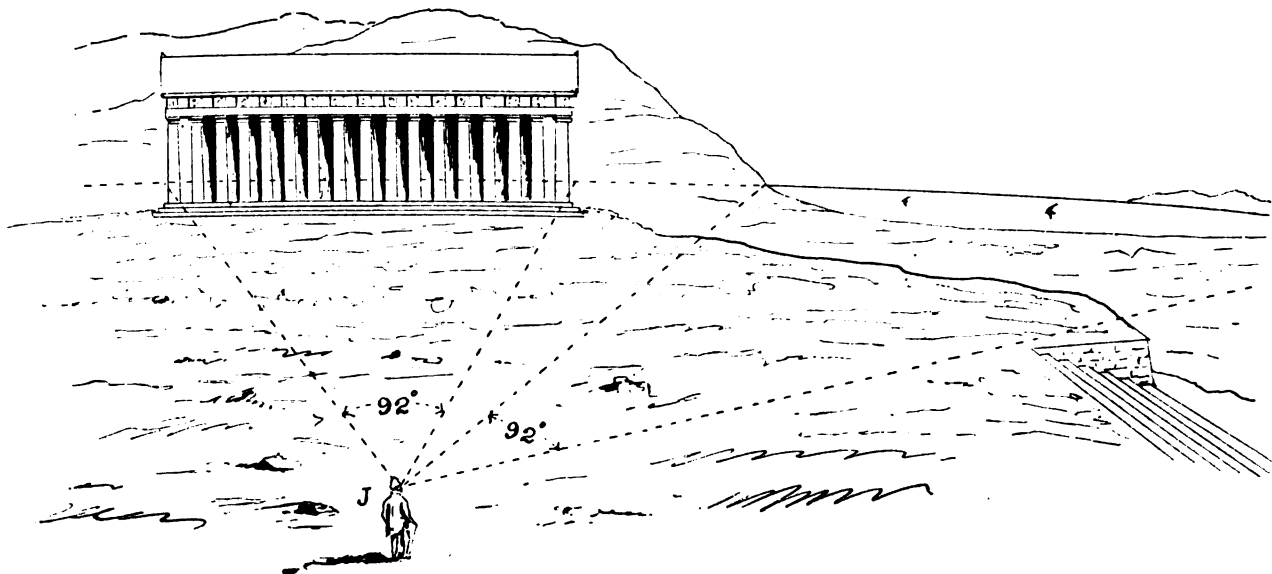
$$BC = AC \times \cot. \phi$$

Where BC equals the required radius, ϕ , the angle made by the visual rays with the horizontal, and AC , the vertical distance of the point-of-view above the plane of the horizon, which for heights less than one thousand feet may be taken as twice the elevation of the point-of-view above sea-level. It will be seen from Figure 1, where A represents the point-of-view, B a point in the horizon, and O the centre of the earth, that the angle ϕ is the same as that between the radius, BO , and the vertical, AO , from the point-of-view.

In this and the following figures, the elevations and angles have been shown much exaggerated in order to avoid confusion of lines, and show the method more clearly.

Figure 2 may be supposed to represent a perspective view of Figure 1, with a section of the horizon line passing through B . Here is shown, at FEG , a view of the horizon line, somewhat as it would appear from the point A ; the short line, ED , representing the greatest deflection of the curve from a straight line, FG , joining its extremities.

Now, to return to the natural horizon, any one who has visited



theory, the mistake seems to have been made of comparing the Parthenon lines with an arc of the horizon limited by the natural visual angle of 60 degrees. What methods were used in making the tests referred to, the writer is unable to state, but the result obtained by Penrose showed but little more than one-half as much deflection in a 60-degree arc of the horizon as in the flank-lines of the Parthenon.

The following calculations will show that Dr. Braun's theory was right, so far as it went. But, furthermore, I propose to show that not only do the flank-lines of the Parthenon harmonize with the curve of the sea horizon, as seen from the Acropolis, but that the curves are really parallel when the correct point of observation is chosen and the whole length of the sea horizon visible from that point is considered.

In order to make the method of my calculations clear, let us note—first, some of the characteristics of the sea horizon, and

the Acropolis at Athens must have been impressed by the magnificent view of the sea which appears towards the southwest. A very clear impression remains in my mind of this view as seen from the platform of the Nike temple, in the spring of 1897. On a clear day, the horizon may here be traced from the slope of Hymettos, towards the east, to the shore of Salamis on the west, broken only by the island of Ægina, and one or two other small islands. To be sure, the heights of Corinth appear above the horizon towards the west, but as the shore-line is here below the horizon, the curve is continuous until it strikes the shore of Salamis. The length of this arc of the horizon I have ascertained to be about ninety-two degrees.

When the extreme refinement displayed by the Greek architects in the delicate entasis of their columns and in the correction of slight optical illusions is considered, it seems to me a reasonable assumption that, in the matter of horizontal lines, they should have

taken as a basis this conspicuous and sharply defined natural line, which is the true horizontal, rather than the shortest distance between two points—which is the common practice to-day.

As has already been said, the curvature of a given arc of the horizon varies with the height of the observer. In the following calculations the elevation has been assumed to be 485 feet, which is, as near as I am able to ascertain, the height above sea level of the Nike temple platform, where one has the best view of the horizon that can be obtained from any part of the Acropolis or of the city.

The mean radius of the earth being 20,898,240 feet, we may compute the length of AB , or of a visual ray from the given elevation, by means of the following formula:—

$$\begin{aligned} AB &= \sqrt{AO^2 - BO^2} \\ &= \sqrt{20,898,240^2 + 485^2 - 20,898,240^2} \\ &= 142,378 \text{ feet, then} \\ AC &= \frac{AB^2}{AO} \\ &= \frac{142,378^2}{20,898,240 + 485} = 970 \text{ feet, very nearly,} \\ \text{and } BC &= \frac{BO \times AC}{AB} \\ &= \frac{20,898,240 \times 970}{142,378} = 142,376 \text{ feet.} \end{aligned}$$

Now, the length of the arc of the horizon under consideration being 92 degrees, we have, Figure 2,

$$\begin{aligned} BD &= \text{Vers } 46^\circ \times BC \\ &= .30536 \times 142,376 = 43,463 \text{ feet.} \end{aligned}$$

We have, also, by similar triangles,

$$\begin{aligned} ED &= \frac{AC \times BD}{BC} \\ &= \frac{970 \times 43,463}{142,376} = 296.1 \text{ feet,} \end{aligned}$$

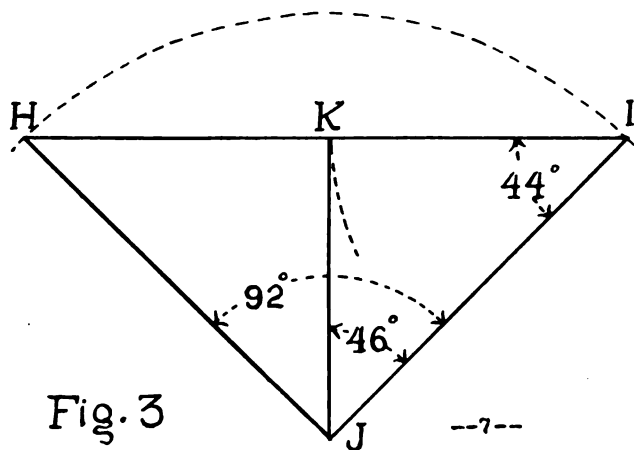
which is the actual deflection, in feet, of the horizontal line between Hymettos and Salamis, from a straight line joining the extreme points; viewed, however, from a distance of more than eighteen miles.

Let us now suppose that the northern flank of the Parthenon is being viewed from a position where the length of the flank will be subtended by an arc of 92 degrees described about the point-of-view as a centre. The length of the flank being 228 feet, we have, Figure 3, the point-of-view, J , at a distance JK , directly in front of the middle of the flank.

It will be seen that

$$\begin{aligned} JK &= \tan 44^\circ \times KI, \\ &= \tan 44^\circ \times 114 = 110.08 \text{ feet.} \end{aligned}$$

In order to compare the deflection of the horizontal lines of the Parthenon with the deflection of the arc of the horizon, that we



have been considering, we need to note the relative angles of the visual rays. We have assumed such a point-of-view in front of the Parthenon, that the horizontal visual angle is the same as that which includes the limits of the arc of the horizon under consideration. The vertical visual angle, in our view of the horizon, will then be measured by ED , in Figure 2; but ED is distant 142,376 minus 43,463 = 98,913 feet. To find XY , the corresponding measure for the same visual angle at a distance of 110 feet, we must apply the proportion:

$$\begin{aligned} XY : ED &:: 110 : 98,913, \text{ or} \\ XY &= \frac{296 \times 110}{98,913} = .329 \text{ of a foot.} \end{aligned}$$

which is within two thousandths of a foot, or considerably less than

one-thirty-second of an inch, of the exact mean between the deflection of the entablature and stylobate lines on the flanks of the Parthenon, as given by Penrose. Or, in other words, the horizontal lines of the Parthenon, as viewed from a point 110 feet distant from the middle of the north flank, correspond almost exactly with the curve of the horizon, as seen from the most favorable position for viewing it in Athens. Reference to a plan of the Acropolis will show that the position taken as a point-of-view is one of the most favorable that could be chosen for viewing the northern flank of the temple, and that no such good view of the southern flank can be obtained from the Acropolis, on account of its nearness to the precipitous slope on that side.

At the time the Parthenon was built, the Propylæa, which now somewhat interferes with the view of the horizon from the point indicated at J , had not been erected, so that an observer stationed at that point could then see both the Parthenon and the horizon line without changing his position, and the view of the horizon thus obtained would not vary appreciably from the one on which my calculations are based. It would have been an easy matter, with straight edges and movable ordinates, for two or three men to have taken a pattern, as it were, of the sea horizon at the distance of 110 feet from one of their number stationed at J , and then to have transferred this pattern a little to the left, where it could have been used as a base-line for the building under construction.

The writer has been told that the pioneers of the West often levelled their houses by sighting over the horizon of the prairies, which is a far less accurate method than that available to the Greeks, with the sharply defined sea horizon in full view.

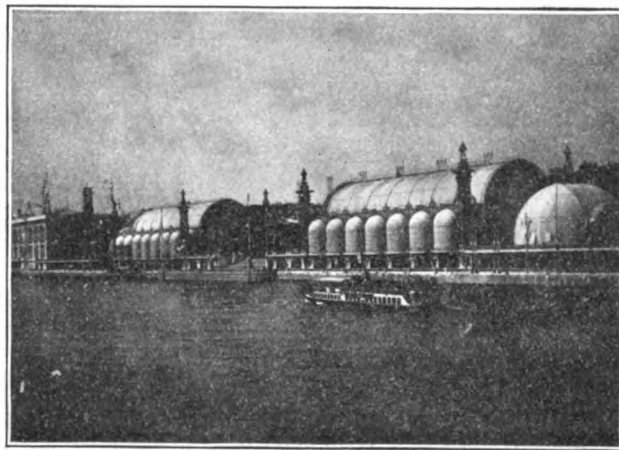
Although the curvature of the stylobate lines, as they exist to-day, may be easily measured, it is necessary to estimate, in part, the curvature of the entablature lines of the flanks, on account of the ruined state of that part of the temple. Taking this into consideration, as well as the fact that I have been unable to measure altitudes and angles with perfect accuracy, it may be considered remarkable that the result of these calculations comes so near the mean of the deflections of the lines of the Parthenon, as previously measured and estimated by Penrose and other observers.

During the long period of more than twenty-three hundred years that has elapsed since the building of the Parthenon, though Nature's line has not changed, various causes have altered the lines of the building beyond any man's power to restore perfectly. It would, therefore, be useless, in their present state, to attempt to determine whether or not they belong to any class of Conic Sections. Penrose, however, states that the Parthenon curves approximate arcs of circles, while we know that the horizon line is a perspective view of an arc of a circle, which would vary only slightly from a true arc within the limits taken. Equal portions, therefore, of the horizon and of the Parthenon lines, such as would be included within the natural visual angle of an observer stationed at the point J , would appear parallel so long as the deflection from the straight line is the same in both cases for an arc of 92 degrees, which the result of the above calculations shows to be true.

I believe, therefore, that it is safe to conclude that the builders of this matchless structure, sensible of the beauty of that long, sweeping curve, laid their horizontal lines parallel to the great natural line that was always before them, regardless of extra labor, so long as perfect harmony with Nature might thus be secured.

WILBUR F. DECKER.

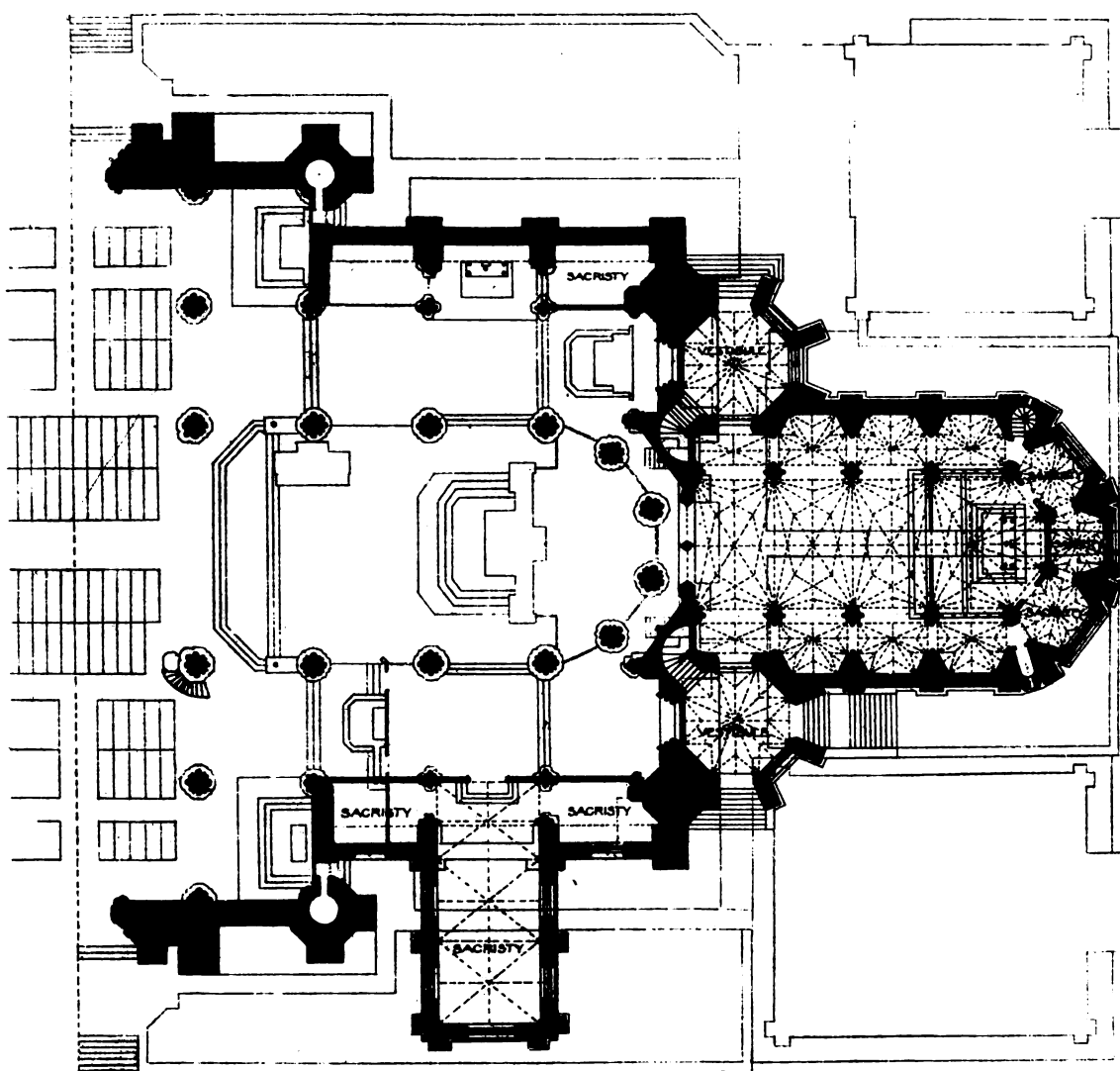
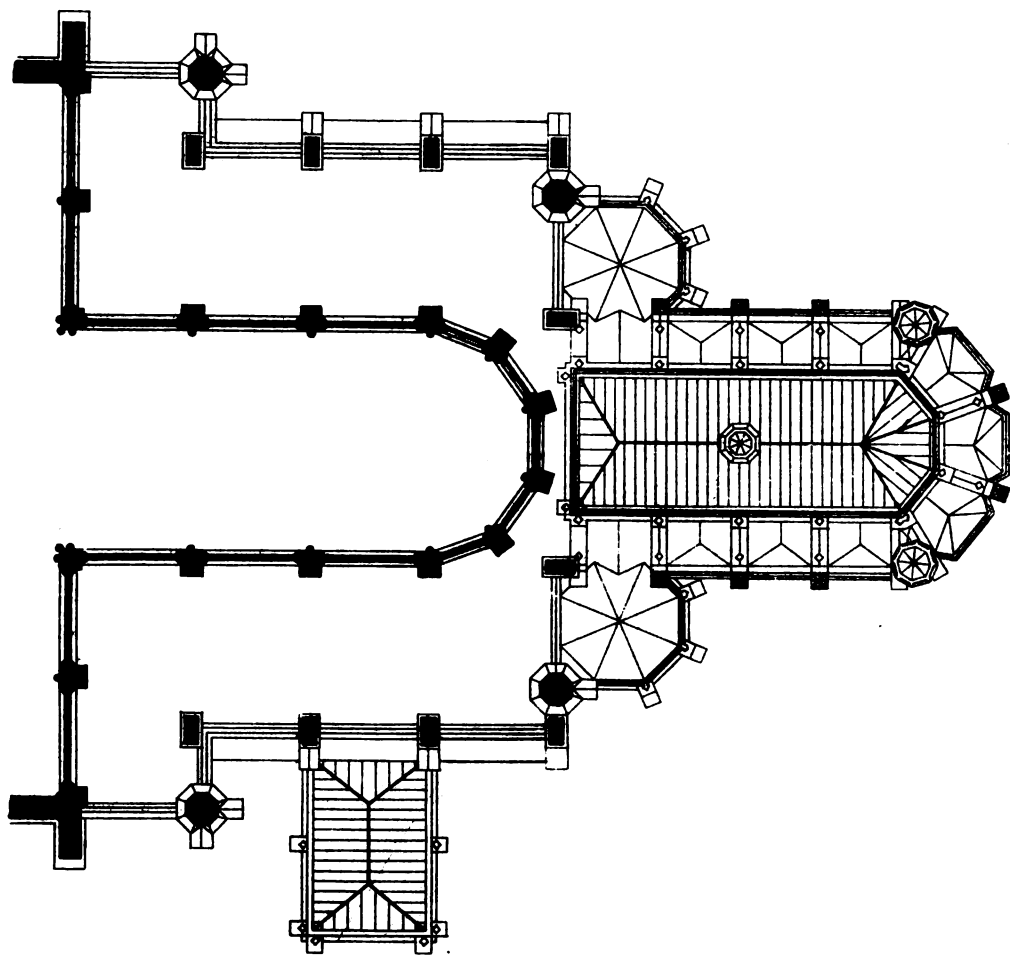
THE PRACTICE OF LETTERING.¹



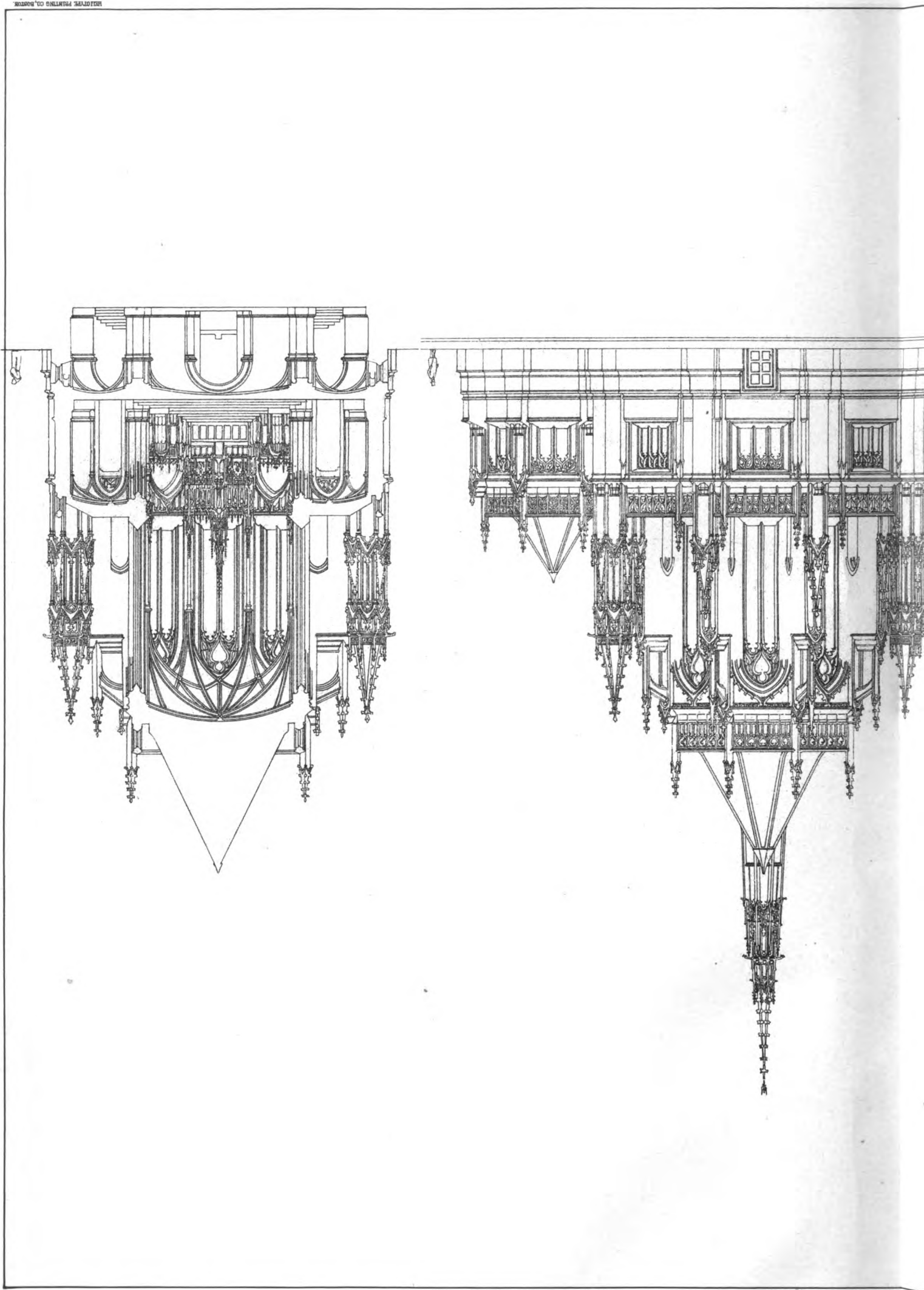
The Horticultural Buildings, Paris. Gautier, Architect.

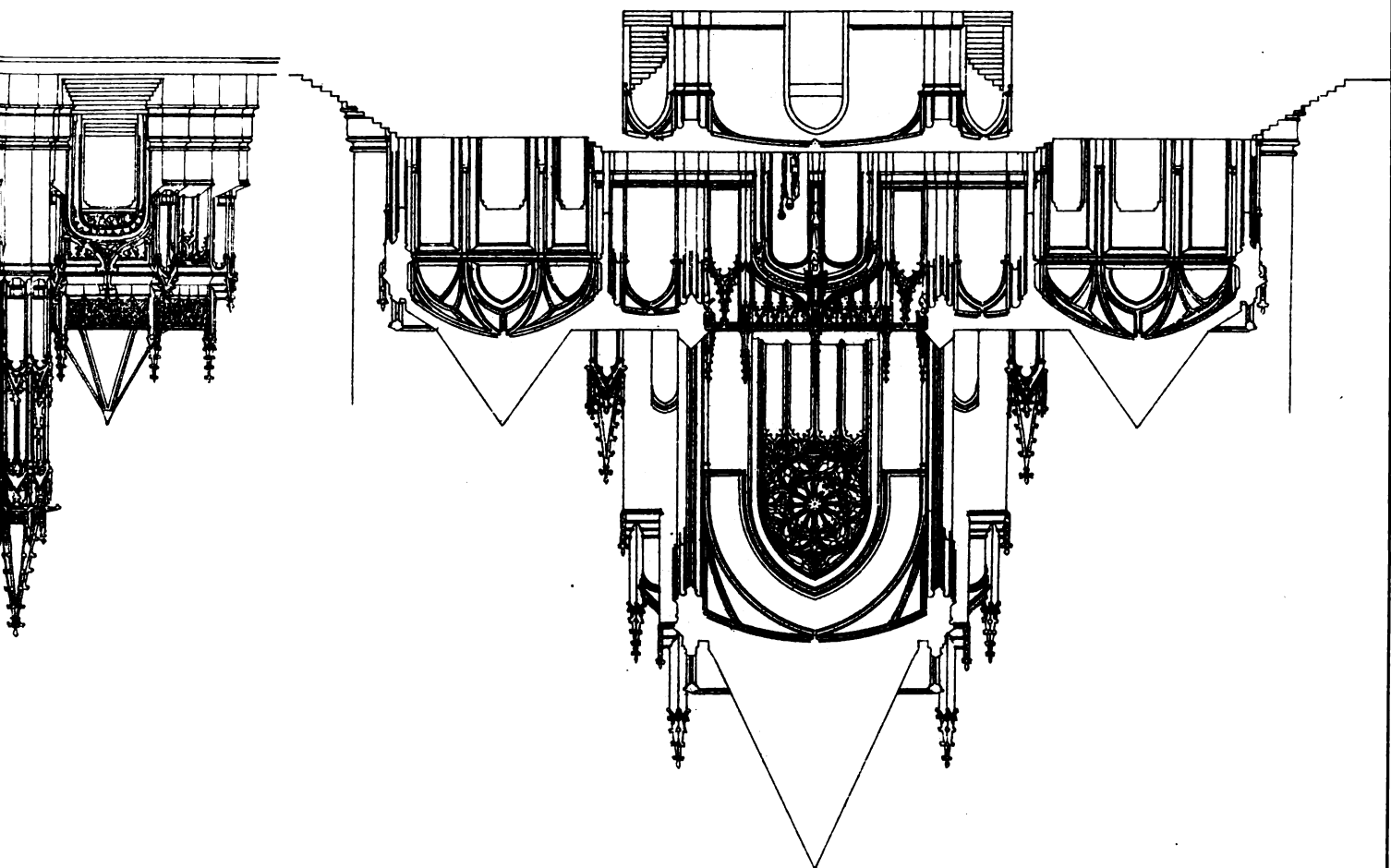
IN this paper I have no new discovery to bring before your notice, and no new process of study to advise. My subject is that one, next to the faculty of intelligible speech, most intimately bound up with the life of every person of elementary education, and my object in bringing it before this Society is to endeavor to gain some supporters for a movement against certain tendencies of the day,

¹ A paper by Edward F. Strange, read before the Society of Arts and printed in the *Journal* of the Society.



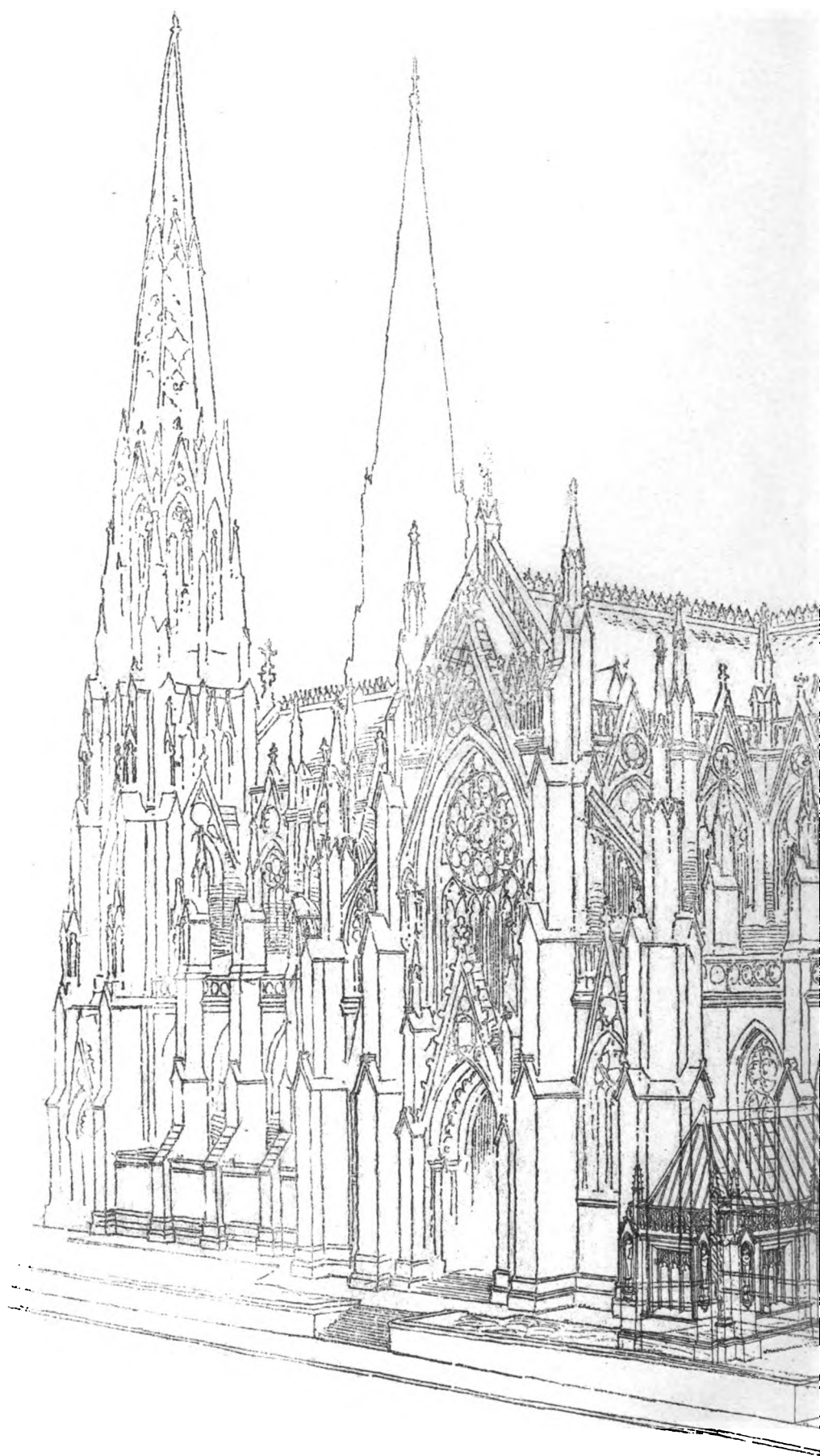
A COMPETITIVE DESIGN FOR THE LADY CHAPEL OF ST. PATRICK'S CATHEDRAL, NEW YORK, N. Y.
 CRAM, GOODHUE & FERGUSON, ARCHITECTS.

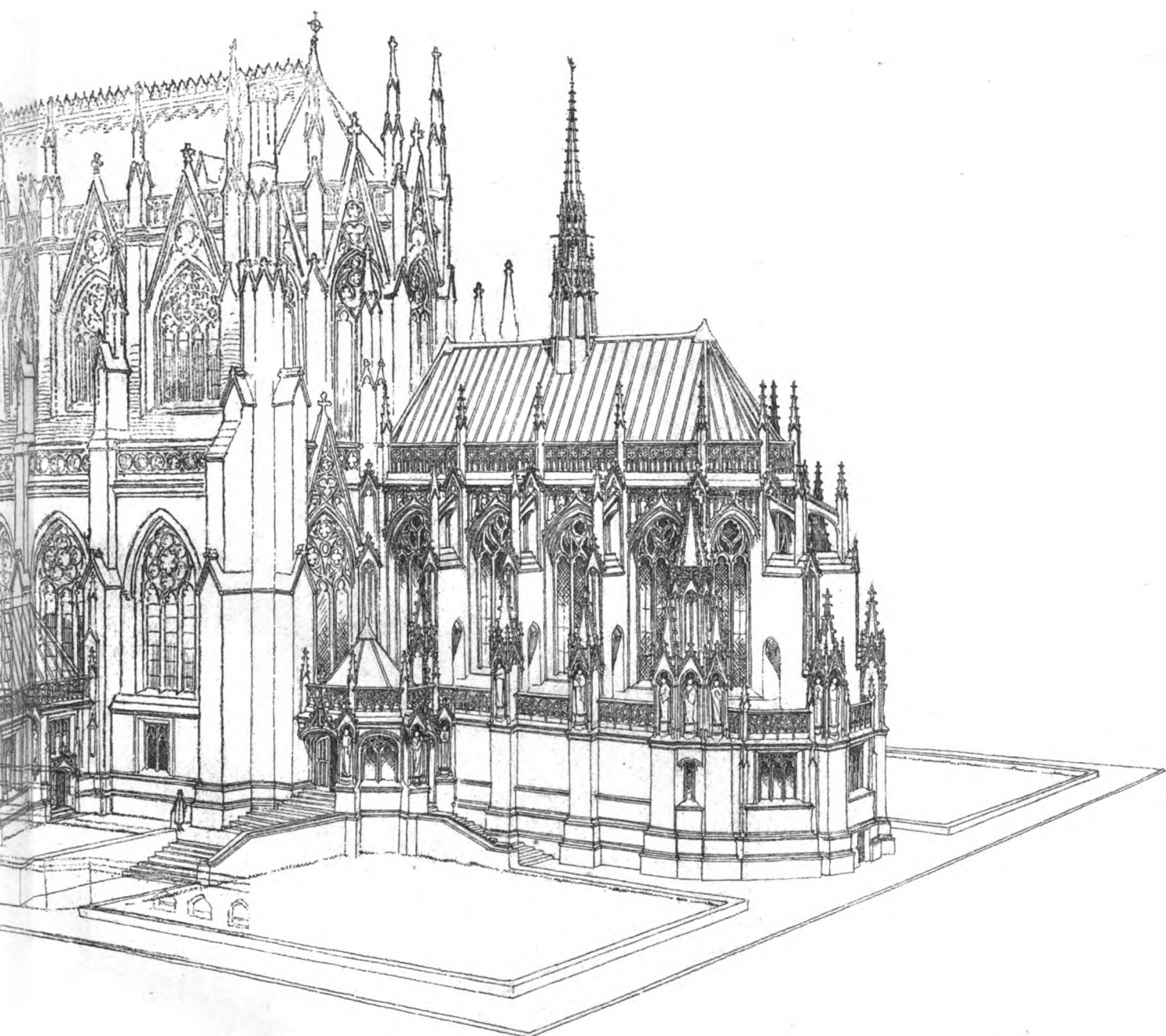




A COMPETITIVE DESIGN FOR THE LADY CHAPEL OF
GRAM, GOODHUE & FERGUSON







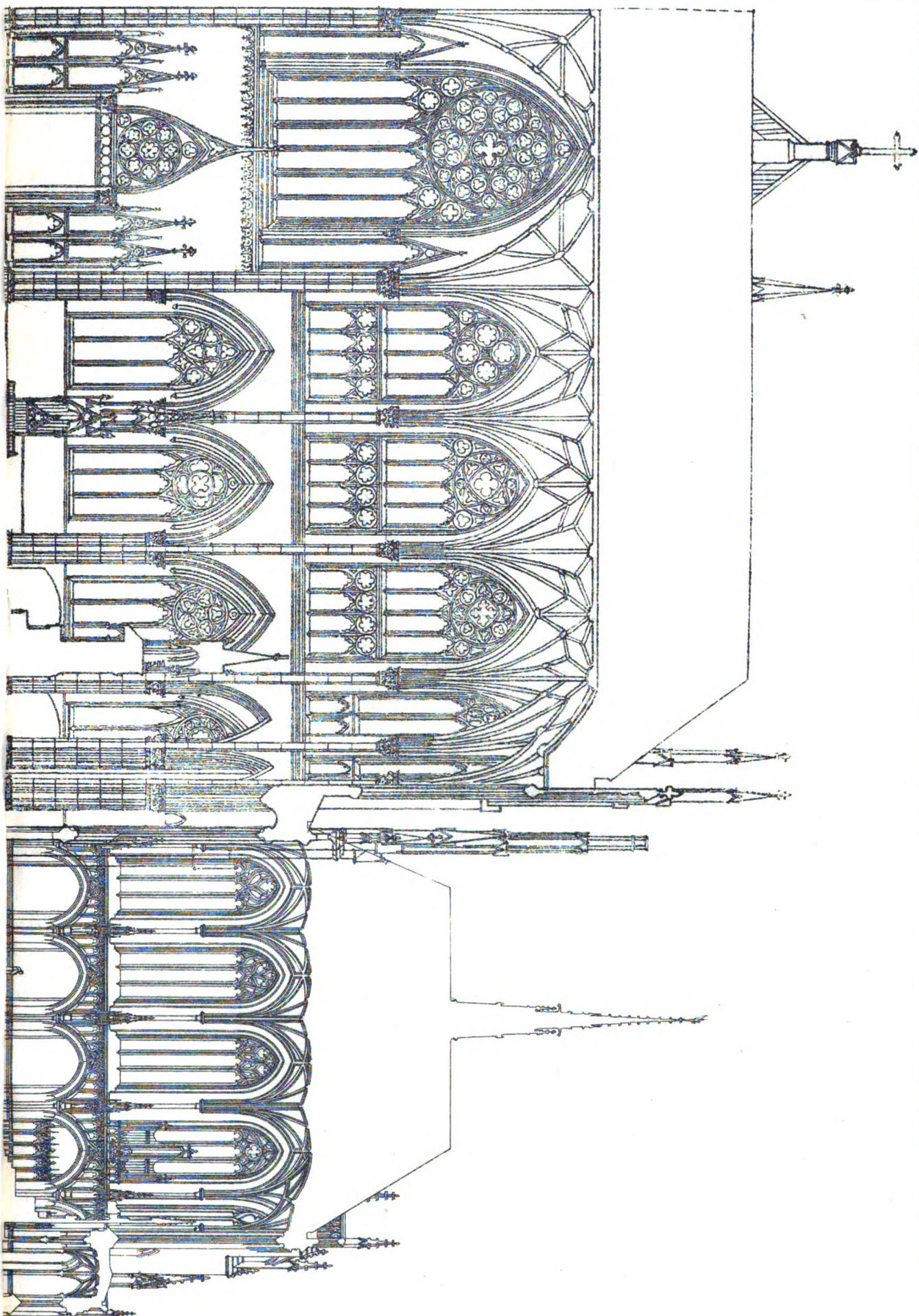
CHAPEL OF ST. PATRICK'S CATHEDRAL, NEW YORK, N. Y.
J. & FERGUSON, ARCHITECTS.

MILITARY PRINTING CO., BOSTON

EMERSON ARCHITECT AND BUILDING DEWS, AUG. 15, 1900.

DESIGNED BY THE AMERICAN ARCHITECT AND BUILDING CO.

No. 1256.



which appear to many of us to be ugly, unnecessary — the terms are almost synonymous — and fraught with great danger to the younger generation of artists and craftsmen.

I need not take up your time with a catalogue of the various faults of the most modern lettering. There is hardly a street in which you may not see bad letters displayed with all the frankness in the world; there is hardly a publication in which you will not find type or drawn letters calmly devoid of any pretensions to beauty; there is hardly a public building which does not possess some weakly pretentious inscription in which the carelessness or vanity of the writer is set forth in a way he hardly intended. And my whole object on the present occasion is to try and point out how easily these things might have been better done, and how greatly a little thought, a little modesty, a little good taste would have assisted the makers of these bad letters in the objects they had in view when they produced them.

Now the first element of a cure is to ascertain the origin of the disease. In this case I am convinced that much of the trouble arises from an idea that students and craftsmen seem to be continually getting into their heads that they have to design the letters of the inscriptions on their works. Now that is precisely what they must be warned against. You cannot design a letter. You may burlesque it. You may mutilate it by breaking its back in unexpected places. You may complicate it with weird growth of a more or less fungoid nature. But you cannot design it, for design implies invention, and no one can be said to invent what already exists; while any attempt to give new forms to the letters in current use can only be compared for audacity with deliberate experiments in the making of new words — I would even go so far as to say new languages.

For let us consider shortly what the letter really is. It is the accepted medium of intellectual exchange, the current coin of educated civilization. It bears its value on its face — the form agreed on by the millions who use it. No man may measure the process of imperceptible refinement by which these twenty-six symbols have arrived at their present state of almost world-wide acceptance. Wherever the Latin races have gone these letters are the daily tools of written intercourse. Wherever the Anglo-Saxon sets his foot he carries with him this great bond that unites him to his fellows. Some nations, indeed, stand out against them; those of Northern and Southeastern Europe for example. But even among them our alphabets have no little currency, and the adoption of European methods of education in science, art and literature is putting a heavy strain on the literary patriotism of Oriental nations — as, for instance, Japan — which are seriously setting themselves the task of coming into line with us.

Now, if a craftsman lays himself out to give a letter a new shape he is paying himself the compliment of asking several hundred millions of persons to accept his image and superscription instead of that which many generations of themselves have already agreed upon. It would be sublime if it succeeded. But in practice it is simply ridiculous.

I must guard against being misunderstood on this subject. I have said that you cannot design a letter — the form stands. But it must be made absolutely clear that this statement applies only to essential structure. It is impossible for any one who possesses any individuality whatever to express himself in any medium without endowing it with character. That may be seen in handwriting, slipshod and utterly bad as most of our scrawls are. If we want to be understood there is always a point beyond which we may not go. However our training, our carelessness, our physical peculiarities may warp them, we must always keep recognizably close to the accepted forms of the written letter, or our purpose in writing fails, we do not convey our thought to the intended recipient of it, we have simply spoiled paper with futile and illegible marks.

But as to character. This means, for us, a certain personal singularity in the making of letters which gives distinction — individuality anyway — to the accepted, and still easily understood, letter. I would instance to you the types made by William Morris, and especially the Roman type on the basis of that of Jenson. There is nothing to prevent a craftsman from getting his character into his lettering — if he has any — and takes pains enough to develop it. But it will not be done by setting to work as I see so many do, who simply sit down at the last minute to hunt up a convenient model for the hated but necessary lettering, copy it more or less perfunctorily, put in a few eccentricities or excrescences on the spur of the moment, and then wonder why the result does not look well.

So far I have dealt with the abstract drawing of the letter, but there are other considerations of high importance. But before passing on to them, I wish to draw your attention to an example of definite form, which is not only historically interesting but of the greatest practical value. This is the alphabet of square capitals from the "Geometria" of Albert Dürer, A. D. 1525. Each letter is placed in a square, and a relative scale of proportion is worked out to one side thereof. Thus the thickness of the main shafts of the letters is one-tenth of a side. The great curves are struck from circles nine-tenths of a side in diameter, the smaller curves from circles respectively one-third, one-fifth and one-tenth of a side in diameter, and the distance of the uprights from the side is generally one-tenth again. Now I know I must face a protest against a mechanical hard-and-fast rule for the drawing of letters. But the objectors, if such there be, must not too hastily conclude that this example is nothing more. To begin with, it will be seen to be a singularly good

alphabet. And a little consideration will show that Dürer — the last man one would expect to tie himself down to a formalism — did not invent the construction to produce the letter; but seeing that the letter was good, worked out the natural law of its excellence, and set it down for the benefit



Durer's Alphabet.

learning to write, and the result was the production of the copy-book in the beginning of the sixteenth century, and the publication of methods which, as my examples, I hope, will prove, were not new, but only now for the first time made easy of access to those interested.

The influence of material on the form of the letter is a matter that the craftsman can only work out for himself. It is impossible to give him rules or teach him limitations. For the very fact that he is entrusting himself with the making of an inscription implies a mastery of his tools, and if he has acquired a good form of letter those tools will do the rest. Yet it is necessary — with so inconsiderate and light a heart does a man often set about a serious operation — it is necessary to point out one danger. He must not take a style of lettering which is good in one material and for one purpose, and try to adapt it by brute force to other circumstances. His method of study must be a genuine one, and, it goes without saying, somewhat laborious. I can give it in no better words than those used by William Morris in describing the means by which he arrived at the first of the Kelmescott types. Having decided on Jenson's type as his model, he set to work to learn it, "Drawing it over many times," said he, "before I began designing my own letter, so that though I think I mastered the essence of it, I did not copy it servilely." That, indeed, is the crux of the whole matter of learning to make good letters. The essential form of a good model must be acquired till it can be produced without conscious effort, and, as it were, automatically. The personality of the craftsman and the materials with which he is working will then react on this, giving it interest, beauty, or character, according to his talent.

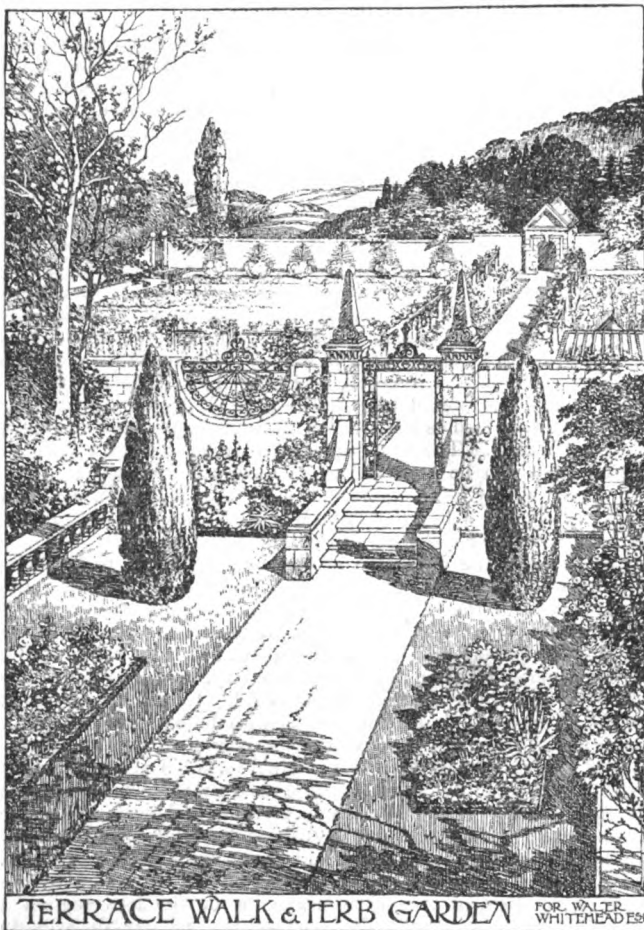
Before I leave the discussion of the form of letters to deal with one or two points in the application of them, I must needs touch upon a branch of the subject which, to some extent, overlaps both these questions, viz, type. This alone has furnished material for many notable papers which have been read in this room, and it would be impossible, even if it were necessary, for me to treat it adequately in the short space at my disposal. I exhibit a series of examples of type, chiefly for comparison with letters executed under other conditions, and to show what necessary modifications the demands of the printer make on the original form. I need not repeat the well-known qualities of good type; I need not review at length the merits of the early types of Caslon, or of those of Morris. But I do desire to take this opportunity of entering a protest against the fancy types beloved of the compositor, and the uses he makes of them. No age has yet seen such an array of ugliness as is offered by the average advertisement-page of a magazine, or the lettering on a bill-head or trade-circular. The soul of the printer delights in variety. It is his idea of art. A small octavo hand-bill issued to announce some recent lectures of mine on this very subject contained no less than thirteen different fonts of type in about fifteen lines of matter; but I did not design it, and was, on the whole, rather glad to have a bad example so easily placed in my hands. Fat, ugly forms, letters shaded to look like masonry, mere shading alone, as it were the ghost of a letter, ornament without backbone; all these are in daily use and very much admired. Some of the recent developments, especially those imported from America, are particularly vile and irritating.

Their designers are, indeed, well up to the advice given to students by a recent writer on the subject, to "mark what is characteristic in the letter; to develop what is peculiar to it; to curtail, or it may be to lop off, anything which tends to make this confound it with another; to emphasize in short the individuality of each individual letter and make it unmistakable." The consequence is that we have letters like H, M, N set upon ungainly stilts; the rotundity of O and C made to cover the meanness of the letter which follows; while the curliness of the tails of those letters which possess them is fearsome

and bewildering to contemplate; or else the poor tails themselves are "lopped off." I do plead for simplicity and modesty in letters made for public use. Nothing is more irritating or defeats its own end more thoroughly than an eccentricity in the form of the letters which withdraws your attention from the word which they are used to make. For this is, after all, one of the greatest faults of the modern maker of letters: he is so eaten up with his ingenuity or phantasy as to forget that his letters are only the elements of what should be a legible announcement.

It should be unnecessary, even ridiculous, to remind craftsmen that the purpose of making letters is to convey information and not to advertise their own dexterity; but the examples of every-day life seem to show the former to be too often the last consideration. The modern poster depends, as a rule, on a design of weird tints, which may or may not be capable of suggesting anything to the beholder save a pardonable desire for color-blindness. The lettering, very often tied in an inextricable knot, dances drunkenly across a portion of the design: or in great misshapen masses makes it top-heavy. No one seems to dare to try the experiment of extreme simplicity: a good, bold, well-chosen letter, spaced with regard to the relative value of the different portions of the announcement and free from any complications of pattern of any kind whatsoever. Yet, surely, it is one of the highest canons of fine-art that beauty and force are dependent upon simplicity rather than elaboration. The fact is that too much attention is given to the letter as a unit. It must be considered in relation to its fellows, the whole alphabet as a whole, for it is only after you have settled the shapes of your letters that your designing begins, when the question arises as to what you will do with them.

THE SIMPLON TUNNEL.



From *Building News*.

ON November 13, 1898, work was begun on the Simplon Tunnel. The contract calls for its completion in five and one-half years, and the price to be paid is 69,500,000 francs (\$13,413,500). It will have a length of 20 kilometres (12.4 miles), and will be the longest tunnel in the world. When completed, it will be the third one connecting Italy with outlying countries by direct rail, and will accomplish a saving of 77 kilometres (43.5 miles), or from 7 to 8 per cent on travel from Paris to Milan, as compared with the Mont Cenis or St. Gothard tunnels. The Mont Cenis Tunnel has a length of 13 kilometres (8 miles) and the St. Gothard a length of 15 kilometres (9.3 miles).

When in the fifties the wonderful project of drilling the Mont Cenis Tunnel was undertaken, fathered by the courageous Italian Minister of State, Cavour, no machines for drilling were in existence, and it was calculated that a period of twenty years would be necessary for every 5 kilometres (3.1 miles) of tunnel drilled. Then Engineer Sommeillier, in charge of the work, constructed the first

drilling-machine, and, although crude, it was satisfactory enough to accomplish ten times the work done by manual labor, and enabled him to finish the tunnel in eleven years. The St. Gothard Tunnel was finished in from eight to nine years.

The Simplon Tunnel begins in Switzerland near the little town of Brig, in the valley of the Rhone, Canton Wallis, and ends in the valley of the Diveria, on the Italian side near Isella. It will be perfectly straight, except for a small curve at the ingress and egress. The contract for the tunnel provides for a fine of 5,000 francs (\$965) per day if the time limit is exceeded, while a gratuity of the same amount per day is to be given if it is finished before the stipulated period. A little computation will show how disastrous strikes will be. A strike of ten days has just ended.

The fundamental principle in tunneling always has been to drive the hole, excavate, and follow it up with the finishing masonry, making provision, of course, for ventilation, which is generally sufficient at first, but which becomes insufficient when the work progresses towards the centre, when the incoming fresh air mixes with the outgoing gases. The methods employed by Engineer Brandt, who has been in charge of the undertaking, is to drive two holes parallel within the radius of the excavations, leaving a dividing-line, one hole being excavated about 17 metres (55½ feet) in advance of the other. These are built for a single track, and later on the dividing-wall can be broken through for double tracks if necessary. At distances of about 200 metres (656 feet) transverse connections between the tunnels are made through the dividing-wall and are provided with doors. To obtain sufficient ventilation, powerful air-blasts are blown into one side of the tunnel, which return through the other side of the divide, and thereby conduct outward all foul air and bad gases. When the air in the interior increases in heat, it is cooled by showers of cold water which has been led from the exterior of the mountain under high pressure. Through practical experiments in the mines of Spain, Engineer Brandt has proved that air at 50° C. (121° Fahr.) by this means can be reduced to 15° C. (59° Fahr.). These same streams furnish 1,000 horse-power for driving the drills. The miners, therefore, always work in an artificial atmosphere of cool, fresh air.

Engineer Brandt's invention is a hydraulic rotary drilling-machine, by which it is hoped to complete the tunnel in less than contract time. It is used singly and in battery form. Prominent engineers come from far and near to examine this powerful mechanism.¹

Another of Mr. Brandt's inventions is a machine for loosening and removing the debris after the explosions and blasts. It throws a powerful stream of water in a jerky manner into the stones loosened by the force of the blasts, thereby washing away the dirt. This makes excavation easier. These machines run on rails, and when in use follow each other in rotation.

The historical museum of the Kaiserlich und Königlich State Railroads in Vienna possesses the first hydraulic rotary machine invented by Brandt, which he used in tunneling through the Arlberg, in Austria, in 1867.

During November, in which ten days were lost on account of the strike, there was drilled at the south side 144 metres (472 feet) and at the north side 123 metres (404 feet). The total, since the commencement of the work, is 3,574 metres (about 2½ miles) — 2,148 metres (1½ miles) at the north side and 1,426 metres (nine-tenths of a mile) at the south side.

ADOLPH L. FRANKENTHAL, U. S. Consul.

BERNE, December 12, 1899.

BOOKS AND PAPERS

THE "Architectural Annual,"² for which the Architectural League of America at its last meeting declined to stand sponsor, is the very creditable, if not wholly successful, accomplishment of a very ambitious undertaking, one of those undertakings which none but the tyro in matters of publishing would ever dream of attempting without some sort of reliable guaranty-fund behind him. Doubtless, the announcement that the publication of this first number had entailed a loss of several thousand dollars was enough to decide the League to decline to attempt to maintain the "Annual" as an official publication, but we cannot help feeling that the egoism of the editor, as displayed on his title-page, caused some members to vote against the proposition advocated by him.

Excellent as this first number is mechanically, we hope that in the following years the editor may come a little closer to our conception of what such an annual publication ought to be, and our conception is, briefly, that the chief function of the editor of an annual is to look back rather than forward, to put the history of the past year into chronological sequence, to bring together the loose ends left by the weekly and monthly journals, — which have to attempt to keep up

¹ An illustration of the machine accompanied the report, and is filed for reference in the Bureau of Foreign Commerce.

² The "Architectural Annual," published under the auspices of the Architectural League of America and edited by Albert Kelsey, late holder of the Travelling-scholarship in Architecture of the University of Pennsylvania; former President of the T-Square Club; Delegate to the International Congress of Architects, Brussels, 1897; Member of the Committee on Works of Art of the Fairmount Park Association, and President of the Architectural League of America. Issue of 1900. Philadelphia. The "Architectural Annual," 931 Chestnut St. Price \$3.50.

with the record of the beginnings of things, the real importance of which can only be revealed by the passage of time, — to review and record rather than to exhort and admonish. It is far easier, of course, and more entertaining to an editor to fill up his space with his own lucubrations and vague speculations rather than spend his time in digesting and boiling down to a record of proper compass the doings and sayings of other people; but it seems to us that such an annual should be of so definite a character that one would know that in turning to it for information he would find only information of a definite and restricted character, that the third volume would be like the first, and the fourth like the third, so far as the plan of the work is concerned. He ought not, it seems to us, to find it a mere miscellany, and in that no different from a bound volume of any magazine, a miscellany that is a mixture of one kind this year and a hash of dissimilar ingredients next year. It ought not to be merely a magnified exhibition-catalogue of the modern kind — sophomore essays and an unorganized array of illustrations. We believe that if the editor will work in the direction we suggest he will accomplish something of worth and value, something from which he will derive that sufficient support which alone will enable him to feel sure that the "Architectural Annual" can make its appearance in good form year after year. From our point-of-view, the greater part of the text-matter in this publication is out of place. What possible reason can one have for expecting to find in an annual an essay on the "Marquise," or "Bismarck's Birthday Monuments," or "Baron Haussman," or "Commercial Architecture," or biographical sketches of living men, in short?

We regret very much the advent of the architectural Boswell — though it is rather a slur on that gossiping sycophant of great men to so name the modern extoller of the deeds of living men, young men too, though very admirable ones, of course, for he at least had the decency to publish his fulsome flattery only after the death of his chosen subject, while these modern architectural biographers seem to possess neither conscience nor modesty, and the worst of it is that they make the reader feel that the chosen subject is equally lacking in these desirable qualities. The familiar adage *de mortuis nil nisi bonum* stands for proof that it is at least difficult to speak the truth about those whose susceptibilities can no longer be wounded by frank truth-telling. As for the living, an autonym might be invented running somewhat after this form: "*De vivendis verum non potest dici.*"

The "Annual" contains two biographical sketches; one, the tender obituary sketch of Arthur Spayd Brooke, brought the moisture to our eyes because of the obvious sincerity and feeling with which it was written; the other a more ambitious treatment of Mr. Wilson Eyre's work, and though it is far from being ill-done, — infinitely better than those strange psychological expositions that Russell Sturgis and Montgomery Schuyler are employed to write about "great American architects," — we cannot but regret that the notice was written and published. Of Mr. Eyre the writer says, and we believe it very strict truth that he writes, "His aspiration is not to make a stir in the world, but to do what he does worthily." Why then inflict on him or on other people who have the same genuine aspiration — and there are many such — such publicity as this? Publish an architect's drawings by all means, singly or collectively, but let the living man himself alone, or, if he is "that kind of a man," let him blow his own trumpet in the daily papers. As for Mr. Eyre's work, we regard it as almost always the product of a feeling, and a feeling is a too complex thing to be analyzed.

THE *Quarterly Bulletin* of the American Institute of Architects, on the other hand, is very properly conceived and is likely to become a useful publication, supplementing as it does the annual publication of the Convention *Proceedings*, and may help to keep alive in the organization that feeling of common interest and purpose that, until now, has rather waned and dwindled between one annual gathering and another. As it professes to be a society publication, and as that society is but a small part of the profession, the *Bulletin* can be of but restricted usefulness, and must, or should, confine itself to the doings and interests of its own society and eschew the attempt to keep track of and record the doings and sayings of the larger architectural world.

If this is to be its task, we think it will strike most observers that, as had been supposed, the Institute with its various Chapters is a very ineffective and inactive organization, else the editor could have discovered more things to record than the single action of the New York Chapter, which seeks to learn from its own members what theories they hold, or what practice they follow, in the employment of expert service.

THE SCOTT CIRCLE STATUES IN WASHINGTON. — At Scott Circle, in this city, workmen are now putting up an elaborate granite base for a statue of Dr. Hahnemann, in the midst of a grassy triangle facing the side of the equestrian statue of General Scott. On the corresponding triangle on the other side stands the heroic bronze figure of Webster, recently unveiled. The other day two citizens were passing, when one remarked that it was a pity to give that space to the founder of the homeopathic practice. "It ought to have been reserved for Henry Clay," he added. "Ah," responded his companion, "you don't seem to understand the scheme. What they want to do is to typify three great divisions of the Executive Government: the State," pointing to Webster; "the War," pointing to Scott, "and the Interior Departments." — *Evening Post*.



[Contributors of drawings are requested to send also plans and a full and adequate description of the buildings, including a statement of cost.]

A COMPETITIVE DESIGN FOR THE LADY CHAPEL OF ST. PATRICK'S CATHEDRAL, NEW YORK, N. Y.: THREE PLATES. MESSRS. CRAM, GOODHUE & FERGUSON, ARCHITECTS, BOSTON, MASS.

It should be borne in mind that the ground at the rear of St. Patrick's Cathedral is at present in part occupied by two nearly symmetrical structures, one the Archbishop's palace, and the corresponding structure, on the northeast corner, occupied by the clergy in residence. These present structures it is the intention to retain for the present, though it is more than supposed they will be removed. Competitors, therefore, could avail themselves only of the middle space between the two buildings, the size and location of which will be found indicated in skeleton on the ground-plan furnished the competitors, who were instructed not only to design the Lady Chapel as if the two buildings were non-existent, but told that they were entitled to use even the last inch of space between them. It is, therefore, not the least interesting feature of these several designs that they show so many ways of utilizing a very restricted space.

[The following named illustrations may be found by reference to our advertising pages.]

VILLA DESIGNED BY HERREN SPITTLER & KRONFUSS.

This plate is copied from *Architektonische Rundschau*.

FIRST PRIZE COMPETITIVE DESIGN FOR CENTRAL CEMETERY CHAPEL, VIENNA, AUSTRIA. MAX HEGELE, ARCHITECT.

This plate is copied from *Architektonische Monatshefte*.

[Additional Illustrations in the International Edition.]

A COMPETITIVE DESIGN FOR THE LADY CHAPEL OF ST. PATRICK'S CATHEDRAL, NEW YORK, N. Y.: THREE PLATES. MESSRS. HEINS & LA FARGE, ARCHITECTS, NEW YORK, N. Y.

In studying this problem the point most difficult to solve was not so much the design of the chapel itself, as a suitable arrangement for the necessary sacristies and vestries, and a suitable entrance to the chapel.

The only entrance feasible from the floor of the Cathedral to the chapel was through the present vestry in the south aisle of the choir. If this south aisle is to be used as a passageway to the chapel, it would have to be abandoned as a robing-room, for which it is in any event not well suited.

The arrangement shown in the design contemplates utilizing the entire crypt or basement below the chapel as sacristy, robing-rooms, etc., for the choir. The present clergy-sacristy directly behind the high-altar has been retained with slight enlargement. This sacristy should properly be on the same floor-level as the choir, and it would seem desirable at some future time to build an addition beyond the aisles of the choir to provide for this purpose.

The floor of the Lady Chapel is shown raised a few steps above the choir-floor, in order to diminish the descent to the choir-sacristy below.

The architectural character of the design is based upon the French-Gothic at the full period of its development, just before the flamboyant influences were felt. It is expected that the chapel will not be out of harmony with the existing structure, and yet, by a somewhat more elaborate ornamentation and greater delicacy of detail, it will assume that importance in the whole design to which its function and position properly entitle it.

Only slight changes in the existing east wall will be necessary. The entrance would be placed in the east wall of the south aisle and the existing windows above be shortened in order to allow for the roof over the side-entrances to the chapel. The lower centre-window of the east wall would, of course, open into the chapel, but this window is practically masked by the high-altar, so that the difference would not be perceptible from the body of the Cathedral.

Especial care has been given in so arranging the junction between the old and new work that there should be no objectionable pockets where snow could collect.

The estimated cost is as follows: —

Construction, including architect's fees (this item includes ornamental carving, as well as the entire construction, heating and ventilating, lighting, etc.).....	\$134,000
Sculpture and figure-carving.....	16,000
Fresco and mosaic work, including floor-mosaic.....	10,000
Stained glass.....	20,000
Altar.....	15,000
Incidentals and contingencies.....	5,000
Total.....	\$200,000

These figures are reliable, because they are based upon actual proposals lately received for other work of almost identical character.

A COMPETITIVE DESIGN FOR THE LADY CHAPEL OF ST. PATRICK'S CATHEDRAL, NEW YORK, N. Y.: THREE PLATES. MR. WILLIAM SCHICKEL, ARCHITECT, NEW YORK, N. Y.

HOUSE OF E. W. HARRAL, ESQ., BRIDGEPORT, CONN. MR. J. W. NORTHROP, ARCHITECT, BRIDGEPORT, CONN.



CHESTER SEWAGE-SCHEME.—An important Local Government Board Inquiry was held on the 13th inst. by Gen. H. D. Crozier, R. E., into an application of the Chester Town Council for a loan for the purposes of sewage-disposal. The engineer, Major H. Tulloch, C. B., R. E. (past Engineer-in-Chief to the Local Government Board), described the scheme in detail, stating that it was an absolute necessity to pump the sewage. The main sewer would be extended about fifty yards in a straight course, and at the end of that extension the sewage would flow into a sunk well, across the centre of which would be fixed a screen. From the other side of the screen the sewage would be pumped by means of centrifugal pumps into a conduit which would convey it to a long inlet channel to be constructed adjoining the precipitation-tanks. From the inlet channel the sewage would be conveyed into circular precipitation tanks, each tank having the capacity of about sixty-eight thousand gallons; and as these would be eight in number, the total capacity of all the tanks might be taken at nearly five hundred and fifty thousand gallons. During storms the tanks would be capable of dealing with nearly five times the dry-weather flow of sewage (1,250,000); that was giving the sewage two hours' rest in the tanks. The clarified water would flow into a long channel, by the side of which would be placed eight roughing filters, having a total area of 888 square yards, whose object was simply to further clarify the sewage before it passed on to the circular aerobic polarite filters, each of which are 50 feet in diameter, and each having a superficial area of 218 square yards, or a total area of nearly three thousand five hundred square yards. Before being passed over the filters the sewage would flow into a small chamber, from which, when filled to the required height, it would be discharged onto the surface of the filter, the size of the chamber being so adjusted that it would hold sufficient sewage to flood the surface-filter to the depth of from two-and-a-half inches to three inches. The discharges would take place intermittently and automatically. By placing the filters in two tiers it would be quite possible to secure double filtration. In all filters which worked successfully, large quantities of carbonic-acid gas were involved by the destruction of the organic matters contained in the sewage. Dr. Carter Bell had analyzed for him four different samples of the gas at the bottom of the filter, and it was found that it contained about ten times as much carbonic-acid as the atmospheric air. It was evident, therefore, that if they could remove that gas from the bottom of the filter the atmospheric air would rush in from above the surface of the filter to fill the vacuum, and would occupy the innumerable interstices between the grains of the filtering-materials. The aerobic bacteria would, in fact, be better supplied with oxygen, and would perform their functions of destroying the organic matter contained in the sewage in a much more expeditious and satisfactory manner. He proposed to make use of the purified effluent from the upper tier of filters to drive a small turbine and fan, which would draw out the carbonic-acid gas from the bottom of the filters. With reference to the sludge, each precipitation-tank would be fitted at the bottom with a perforated revolving-arm, worked by simple gearing on the surface, so that all the sediment on the floor of the tank could be drawn off at will, through a pipe brought up to nearly the top of the tank, and could be discharged wherever it might be desired to deliver it on the land. The liquid from the sludge would flow back by gravitation to the pump-well, to be pumped and treated again. He was satisfied that by the proposed works a very high standard of purification would be attained. Mr. Hibbert, Alderman of Chorley Town Council and a member of the Ribble Joint Committee, described the working of a similar system of polarite filters at Chorley. The scheme for Chester was an improvement on the one for Chorley, and he would not hesitate to say that, if it was properly managed, it would be almost possible to produce drinking-water. Reginald Arthur Tatton, C. E., chief inspector of the Mersey and Irwell Joint Committee, gave it as his opinion that the system put forward produced good results. The scheme was also supported by the city engineer. — *Engineering.*

THE WATER-SUPPLY OF ANCIENT ROME.—Sextus Julius Frontinus, water-commissioner of the city of Rome some eighteen hundred and twenty-four years ago, tells in his history of the water-supply of that city that there were in his day nine aqueducts which supplied it with water. These were built at different elevations, ranging from thirty-five to one hundred and fifty-eight feet above the Tiber. Their aggregate length was about two hundred miles. On gauging their flow, he found that they received daily from their several sources of supply about one hundred and fifty million gallons. The water-registrar's books, however, accounted for a delivery of only 76,500,000 gallons a day. On looking up the list of water-consumers, he discovered that the actual visible consumption was 84,000,000 gallons daily, of which only 54,000,000 gallons were used in the city, leaving 30,000,000 to be accounted for. This was set down as being lost by leakage from defective structures, or stolen by farmers who lived along the line, or by surreptitious consumers in the city. Much water was also lost from leaks in the distribution-pipes, the existence of which (says Frontinus) it is possible to infer from the fact that in many of the city's wards you meet with water of fine quality which has leaked from the conduits. Whereupon he checked waste by repairing the aqueducts, cutting off unauthorized taps, causing the senate to pass more rigid laws as to stealing the water, and enforcing the laws in a rational way. — *Fire and Water.*

A CAPITOL FULL OF CENTIPEDES.—The magnificent granite State Capitol building here has become infested with centipedes of great size. These poisonous insects are to be found in every department of the State building. A few days ago one was seen in the Governor's private office, and after a lively chase it was killed. It measured 7½ inches long, and is the largest centipede ever seen in this part of Texas. Sheriff George Womack, of Cooke County, came across one of the insects in the corridor of the second floor of the building recently. It was captured alive and placed on exhibition in a local drug-store. It was over six inches long. A few days before that clerks in the State Treasury Department were counting money in the great steel vault when a gigantic centipede ran out from under a package of banknotes. It was cornered and captured alive, and now inhabits a bottle on the counter of the cashier of the department. — *Austin (Tex.) Correspondence, Chicago Record.*

EXPANSION OF METAL UNDER COLD.—One of the most familiar laws of nature is that which dictates an increase of volume with a rise of temperature, and shrinkage with cold. There are exceptions to the rule, however, and these may be more numerous than have been suspected. Water, for instance, shrinks as it cools, until it reaches the temperature of 39 degrees Fahr. It then begins to expand. Ice is lighter than the water in which it floats, partly on this account and partly owing to air-bubbles. The statement is now made that iron and steel exhibit the same reversal of the law that water does. An English engineer who has wintered in Siberia writes to the *Engineering Times* that during the intense cold of January and February he has seen rails on the railway jammed together by an expansion such as he had been accustomed to suppose was the result of heat alone. According to this authority, a temperature ranging from 12 to 40 degrees below zero Fahr. would not appreciably affect the length of rails, but severer cold than that would be attended with expansion. The man who sends this statement to the *Engineering Times* declares that others beside himself are familiar with the facts. The Russian engineers have observed the phenomenon, he says, but hesitate to report it to St. Petersburg because of the apparent conflict with accepted ideas. There are regions in Minnesota, North Dakota, Montana and Manitoba where the temperature often falls 40 degrees below zero during a winter of average severity, and sometimes goes 10 or 15 degrees lower. And there are railroads up there, too. Even though the cold is not so intense as that of Siberia, it would seem as if the phenomenon just mentioned should be perceptible there. Perhaps it has developed, but has been overlooked. Now that attention has been directed to the matter, however, the truth or falsity of the story about Siberia can probably be determined in America.

THE UNITED STATES CAPITOL.—Probably Uncle Sam will be lucky if he gets off with a disbursement of \$3,000,000 for the new porticos and "aprons." According to the statement of Architect Clark, the items of expenditure to date are as follows:—

Cost of old Capitol.....	\$2,750,000
Enlargement of site.....	685,000
Rebuilding after British invasion.....	700,000
New dome.....	1,250,000
Senate and House rooms.....	8,000,000
Works of art.....	1,400,000
Furnishings.....	2,750,000
New terrace and approaches.....	1,200,000
Improvements of grounds.....	500,000
Total.....	\$19,235,000

When the Congress at Philadelphia instructed Washington and three commissioners to see to the erection of a suitable public building for a legislative hall at the national capital, an advertisement for designs was published, specifying that the structure was to be of brick, with a conference-room and a room for the Representatives, each to accommodate three hundred persons, with a lobby; a Senate room of 1,200 square feet of area, a lobby and twelve small rooms for committees and clerks. A prize of \$500 and a building-lot were offered for the best plan; and the winner was William Thornton, of Philadelphia. He was not an architect, and so his idea was turned over to Stephen Hallette, of the same city, who was appointed architect. The work of construction was begun in 1795, and history relates that Andrew Ellicott got \$5 a day and expenses for marking out the foundations, by the aid of astronomical instruments, so that the building would face exactly to the east. In 1800 the rooms now occupied by the Supreme Court and the law library were fitted up for the use of the Senate and House of Representatives. By 1811 the building of the dome was ready to be begun when work was stopped by the war with Great Britain. At that time the Capitol consisted of two detached fragments standing far apart, a long wooden shed providing a covered alleyway from one to the other. This space was to be occupied by the dome. Finding the structure thus incomplete, the British thought they would wipe it out entirely, and so piled a quantity of wood inside of it and applied the torch. The damage done was not very great, fortunately, and restoration was easily accomplished. The freestone pillars in the Chamber of the House, now Statuary Hall, were much injured, and were replaced with the pillars which now stand there, composed of a curious conglomerate marble from Maryland. The cost of rebuilding the portion destroyed by the British was \$700,000. By 1827 the structure was completed, with its rotunda and original dome, and there was no further change of importance until forty-nine years ago, when it became apparent that more room was necessary, and the two great wings were proposed. This alteration was promptly begun, and in 1855 the old dome was removed, work on the new one being carried on throughout the four years of the Civil War. In 1861 the wings were completed, and two years later the figure of Freedom was placed in position on the top of the dome. The original dome was squat, in shape like an inverted bowl, and entirely lacking the grandeur of the present one. Iron is the material of the new dome, which is considered one of the most beautiful in the world. The latest addition to the Capitol was the great marble terrace, finished in 1891. — *René Bache in the Boston Transcript.*

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SUMMARY:—

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THE abominable riots in New York last week which have once more convinced the citizens of that town that its police-force is an organ for and of evil rather than a useful instrument of civilization, have amongst other things turned attention sharply to the manner in which colored citizens at the North are deprived of their rights even when conditions are peaceful and favorable. Recently the pastor of a colored society, in New Orleans, who was speaking indignantly of the manner in which one of his race had just been treated during the New Orleans riots, said that prejudice against the colored man existed in the North as well as in the South, and asserted that until he moved from the North to the Southern States he never saw a black mason building a wall, or a black carpenter building a house, because if colored men tried to work at those trades in the North the white mechanics would strike against them. How far colored men are really excluded from the practice of the building-trades we do not know, but we happen to know that colored young women capable of practising trades are very cruelly driven out of such employment by the white women amongst whom they seek to work, and are only permitted to earn a living as house-servants, because, as yet, the cooks and the nurses have not formed an effective union. So it seems not unlikely that, in certain towns at least, colored mechanics are excluded from the labor unions, and if to the disability of being a non-union mechanic, the unfortunate seeker for the means of earning an honest living has to add the disadvantage of being born neither in Ireland nor in Italy, but simply a free American citizen whose skin contains only a little darker pigment than in that of the sons of sunny Italy, he has not much hope of raising himself above the grade of the hopelessly unintelligent.

THE Senate of the University of New York has submitted at length a list containing two hundred and thirty-four names from which the jury is to select one hundred names to fill the first quota to be enrolled on the tablets of the Hall of Fame of the University. A list of men famous in divers directions selected with the care that has been devoted to this is very interesting in itself, but we fancy he will be learned indeed in American biography who can prove even a shadowy knowledge of four-fifths of the men named, and yet, as this is the first list submitted to the jury, it probably contains the most obvious names that should be enrolled under the several categories. In the two sections that are devoted to the fine-arts and constructive sciences, which most immediately interest us, we find it rather curious that under the heading "Musicians, Painters and Sculptors," Lowell Mason's is the only one of the seven that stands to the credit of Music. Painting is illustrated by

John Singleton Copley, Gilbert Stuart, and W. M. Hunt in the order named, while Thomas Crawford, Hiram Powers, and W. H. Rinehart stand for Sculpture. In the sixteen names under the heading "Engineers and Architects," it is not surprising to find that architects are represented only by H. H. Richardson, Charles Bulfinch, and B. H. Latrobe. It is curious to note how amongst the engineers named the majority seem to have made their fame in connection with canal-work. The list is catholic, however, as it includes mechanical as well as civil, hydraulic, and sanitary engineers.

THE willingness to spend one's own money for the public good is about as reliable a proof of good-citizenship as could be desired. Such a proof has just been given by the Merchants' Association of New York, who, in the public interest and to prevent the consummation of the Ramapo water steal, have been investigating in a very thorough way the conditions which affect the water-supply of the metropolis, and are now distributing the results of their inquiries in the form of a printed report of over six hundred pages. As the investigations and the preparation of the report have required the expenditure of thirty-three thousand dollars, private money, the good faith of the makers of the investigation, who can derive no individual profit from it, would seem to be sufficiently guaranteed. Contrasting the Ramapo scheme with that of municipal ownership of the water-supply, it shows that in the later case there must be until 1918 an annual deficit which would dwindle from nearly two million dollars in 1906, the year of the opening of the proposed municipal supply, to about three hundred thousand dollars in 1917. The plant would then begin to return an income to the city which between 1918 and 1945—the year which would terminate private ownership under the Ramapo scheme—would amount to the appreciable sum of forty-eight million dollars. It points out how, during the existence of the Ramapo contract, it would almost inevitably happen that all future extensions of the water-supply system would fall into the hands of the Ramapo managers, and as a city supply must be constantly enlarged with the city's growth, this would but perpetuate the hold of the Ramapo people on the public and private purse of the citizens. Finally, it has carefully investigated the possible sources of additional water-supply and decides that the advantages of a pumped and filtered supply from the Hudson River itself above Poughkeepsie outweighs many times the advantages of any other source of supply. Finally, it declares that there is an immediate need that steps should at once be taken to provide for an extension of the city's water-supply.

EVERY one who inhabits a growing town must have become familiar with the fact that one of the most difficult problems in municipal administration is how to keep school-house accommodation on a parity with the increasing supply of school-children, which grows by geometrical rather than arithmetical ratio. Whenever a town has to build a new school-house there is always a party in the town, or in the school-committee, far-sighted enough to advocate building a structure much too large for immediate needs, but the opponents of such a course, who see only the undesirability of paying taxes on property which is for the moment idle, usually carry the day, and the result is that growing towns are perpetually building new school-houses and find that they have to pay the avoidable cost of entire new outer-walls, roofs, and substructure, and perceive too late that a true economy would have been effected by building much larger school-houses in the first place. Boston, New York and Philadelphia, as ports of entry for immigrants, are probably more troubled by the school-house question than other cities. The growth of population in these cities is largely an immigrant growth, and the immigrant is prolific and, moreover, his coming is a matter of uncertainty and cannot be provided for in advance, so that a good immigrant season is pretty sure to cause a great overcrowding of the school-houses. Boston, which in the last decade has spent some twenty-two million dollars on the support alone of its school-system, is just now almost as much troubled because of lack of accommodation as New York is, and as it is hopeless to undertake to provide regulation school-houses in time, it proposes to experiment with the portable school-house, and ten of these one-story buildings,

twenty-five by thirty-five feet, are to be built at once. How the building-law which requires that school-houses shall be "first class" or fireproof buildings is to be evaded we do not know, nor yet how it will be possible to build wooden buildings within the fire-limits, but, doubtless, the City Council has a right to make special exemption for these small and temporary buildings, and the fact that each is intended to accommodate only sixty pupils, and on the ground-floor at that, will not make the breach of the "first class" regulation a very grave risk.

IT is doubtful whether a trade combination could give better proof of the inherent wickedness of its irresponsibility and its wilful ignoring of the ordinary laws that govern supply and demand than by its sudden announcement of a decline in the price of structural steel last week. Finding that this exorbitant rate to which the price of structural metal-work had been advanced by them had practically put a stop to building undertakings throughout the country, the iron and steel magnates, so-called, have been differing amongst themselves for some weeks past and individual concerns have not hesitated to cut rates, with the result that prices have been slowly declining for some time. But there was too much uncertainty about the prices and as to what particular mills would accord them for these early shadings of price to bring much relief to contractors, owners, and architects. The present large cut of eight dollars per ton is a welcome relief, of course, but it is not half as advantageous to the building-community, and probably to the mills themselves, as a decline of four dollars would have been eight or ten weeks ago. In all probability the present favorable situation finds contractors in such shape financially that many of them cannot take advantage of it, their resources being already strained by the endeavor to finish their contracts with material they have already agreed to take at the higher rates. In all probability the prices will be manipulated after the manner of that in vogue in department-stores, where a large lowering of prices is advertised largely for a few days and then, just as the shopping public has learned of this reduction and is coming to the establishment with a rush, the prices are marked up overnight fifty or a hundred per cent. Many architects will now be instructed to again take up abandoned schemes and get them ready for letting the contracts, but it is ten chances to one that before most of them can be made ready the price of structural steel will have been moved up again and the bargain-seeking owners will have to buy at the higher figure or once more disappoint their architects by sending in another stop order. The methods of trade combinations are essentially gambling methods.

WE have so often called attention to the abuses that follow from the skilful extraction of half-truths from so-called experts by the prosecution or the defence in a jury trial, and have so many times urged the advantage of having expert testimony in such trials given by official experts acting as *amici curiæ* that it is particularly pleasant to record the spread of the belief that the latter is the only method proper to follow, and note the steps actually taken to bring about the introduction of the practice. The Pennsylvania Bar Association is the latest body to declare itself in favor of the official expert, but, as it is a conservative body, it is not yet ready to advocate the compulsory employment of official experts, and only goes so far as to advise their employment when both prosecution and defence will consent to such employment. The abuses of the present system, whereby the expert, even if he do not consciously feel that he must give only such evidence as is favorable to the side which employs him, is so questioned by his employer as to extract only favoring answers, are too well known to need description again. As the official expert is to be called as *amicus curiæ*, we suppose the examination-in-chief will be conducted by the court itself, and the opposing counsel will only be allowed to cross-examine, a course which ought to place before the jury the real rights of the case as clearly as imperfect human intelligence is capable of placing them.

THE law presumes that every man is conversant with its precepts and conditions, and will hold no man blameless for its violation, and though this is right and proper, it often visits severe penalties on individually guiltless and irresponsible persons. Perhaps no class suffers more than do owners and improvers of real-estate, whose pocket-books are, by the nature of the case, temporarily entrusted to the guardianship of archi-

tecs and builders, and as most men do not build many times in a lifetime, the building-owner is obliged to trust to the honor and capacity of men of whose standards in those respects he has no personal knowledge, and yet he stands to be mulcted in pecuniary damages for their failings. One of the latest instances of a severe loss inflicted on a building-owner came about through delay in the delivery of the first-floor beams for a five-story apartment-house on Amsterdam Avenue, New York, which led to the contractor running up his walls in advance of his beams, these being inserted later. The long walls, evidently none too carefully built, and lacking their natural ties, deflected out of the perpendicular, as might have been expected. The attention of an inspector being attracted, the Department of Buildings remonstrated, but, on hearing the explanation, allowed the owner to remedy the defect if he could. The remedy applied, however, did but, in the eyes of the Department, increase the disease, and he was told his building, already enclosed, must be torn down. The owner naturally sought to defend himself by securing an injunction, but its virtues only lasted a day or two against the representations of the Department, and the unfortunate owner must submit to the loss involved in tearing down and rebuilding; a total loss, very possibly, as the bankruptcy court will probably give relief to the builder.

FORCED at this point to retire to the sick-bed, the writer hopes this fact will explain and palliate the short-comings of the present and, perhaps, another issue.

THE PROFITABLE DISPOSAL OF SEWAGE. — In a letter published in the *Times* recently Mr. G. V. Poore gives some particulars of the results obtained in reclaiming some 1,100 acres of Carrington Moss by the deposit thereon of pail-closet refuse from Manchester. The Carrington estate was purchased by the Corporation of Manchester in 1886, and at that date most of it was let at a rental of 1s. per acre for sporting purposes. The land was, in fact, a peat moss having an average depth of 85 feet, and in its then state was useless for agricultural purposes. By dumping there the night-soil and other refuse from the 80,000 houses in the city which are unprovided with water-closets, the value of this land has in thirteen years been so increased that it is now let to good tenants at the average rental of £2 per acre. These tenants further take from the Corporation 25,000 tons of manurial matter, for which they pay the Corporation at the rate of 1s. 3d. per ton. The estate is not a sewage-farm, which experience shows are pretty generally unprofitable, since the ground soon gets so water-logged as to be suited to the raising of but few crops of a special character. The refuse dumped on the Carrington estate has been dry, and has been spread and ploughed-in after the usual way. Much of the estate is now in the hands of nurserymen and market-gardeners, and the experiment has proved so successful that the Corporation are extending it to 2,500 acres of Chat Moss. But few towns can boast of running any part of their sewage or garbage disposal works at a profit; but where conditions similar to those in Manchester prevail, it would seem that the results attained at Carrington are well worthy of consideration. The plan, cannot, however, be taken as at all generally applicable. Most progressive towns are provided with water-closets, and repeated failures have shown that it is then impossible to profitably apply the sewage to agricultural purposes. Even in cases where water-closets are the exception, the instances in which suitable land can be cheaply obtained for the repetition of the Manchester experiment must be rare, and probably even in that instance, the balance-sheet would have made a much less favorable showing were it not that by using the ship-canal the cost of transport has been kept down to a very low figure. Even apart from this, it may be a question whether most citizens, if given a choice, would not rather dispose of their sewage at a loss, and have the convenience and security of a water-closet system, rather than put up with the drawbacks attached to all other methods of removing faecal matter, even though these methods might promise a reduction in the rates. — *Engineering*.

GLAZING OIL-PAINTINGS. — What is the life of a picture? A good many years ago a member of the commission who was to study the question of the preservation of pictures, and that member was Disraeli, said: "Are you aware that there was a commission appointed by the French Government during the time of Napoleon to inquire into the duration of pictures, and that they reported to the Emperor Napoleon that no picture would last above 600 years?" In *The Nineteenth Century* the matter of covering a picture with glass is discussed. At first it was universally decried. It was called clapping "a window in front of nature." In 1850 Mr. William Russell advised that the most valuable pictures, the property of the nation, should be covered with glass. Certain scientific men were totally opposed to the use of glass. It was declared that the confined air would become superheated with even an ordinary rise of temperature, and that the paint would crack and the varnish scale off. Artists were at first against glass, believing that the details of a picture would be in a measure lost. Faraday was the strongest advocate of glass. In the Dresden Gallery the use of glass, it was shown, had been found advantageous. Finally the glazing of the English national pictures was decided upon, and there are to-day something like 1,700 pictures under glass. It is likely that the London atmosphere is the worst in the world, as far as the preservation of a picture goes. It is not so much the dampness as the presence of soot. — *N. Y. Times*.

RAPHAEL, MICHAEL ANGELO AND LEONARDO. — I.



Russian-Asia Building, Paris. Meltzer, Architect.

THE idea of enclosing in the same frame figures of the three giants of the Italian Renaissance is not one particularly appropriate to dilettanteism and need not be a simple academic pastime. On the contrary, it is easy to draw from this *rapprochement* useful inferences and hints likely to throw new light on the tendencies which the Renaissance obeyed, on the influences which it underwent, upon the historical causes which rendered it possible, and on the varied paths which it followed; it is equally possible to deduce hitherto unexpressed valuations of the difference of temperaments of these three masters, whose work dominates the century which they made illustrious by their genius.

First let us seek to know what was this Renaissance of which they were the most eloquent interpreters. Above all, it personified the revenge of Classic beauty, of the gay and genial spirit of paganism, and of smiling and joyous Mythology upon the dull and funereal tone of the Middle Ages. Fatigued by the tragic struggle of those sombre centuries which filled the interval between the fall of the Roman Empire and the pontificate of Leo X, centuries of fanaticism and barbarism, glutted with blood, saturated with wealth, the Roman religion, triumphant and arrived at the apogee of its power, at length thinks of enjoying its victory, profiting by its opulence to display its glory in magnificent monuments. In the intoxication of success, in the feeling of security which its acquired power gives it, the Church has not felt the danger of the Reformation, which nevertheless has brought it to the brink of ruin, and it has seen detached from itself, if not without noticing it, at least without too much regretting it, those crowds whom the revolt of Luther have drawn away from the Catholic Communion; and it is only at a later time, when heresy threatens to extend everywhere, that the Inquisition will once more light its fires, and will think of extirpating it by punishment and terror, and that the Court of Rome, in alarm, will call the secular States to the aid of the menaced faith, and will inaugurate the policy which rendered possible the massacre of St. Bartholomew, the revocation of the Edict of Nantes and the "dragonnades." When the noise of the controversies stirred up in Germany by the preachings of the rebellious monk begins to reach Rome, the Pope shrugs his shoulders: these, according to him, are only monkish quarrels which cannot trouble the quiet of the omnipotent theocracy. Meanwhile, the national genius takes its spring, and Art answers with admirable eagerness to the solicitations of the faith which demands an apotheosis; everywhere arise monuments which must bear witness to the grandeur of the victorious religion; nevertheless, so long as it is delivered over to itself, so long as it has not yet found the source of inspiration whence shall jet the true Renaissance, Italian art remains stationary and in vain seeks to find its way. It crystallizes itself in Byzantine formulas imported from decadent Greece, it remains incomplete, like the larva which still awaits the last ray of the sun to effect its metamorphosis. Before the discovery of the remains of Greek antiquity, it exhausts itself in sterile researches, and, even afterwards, it remains everywhere powerless where the gleam of this discovery does not penetrate. Perugino, the master of Raphael, and the chief of the Umbrian school, of which the principal attributes are grace and sweetness, is still cold, and his Madonnas are stiff and lacking in animation: the secret of true beauty is unknown to him.

Italian Renaissance dates from the moment when the Grecian fragments were found at Pisa, and the sap began to ascend only on the day when the germ of pagan beauty became grafted on the branches of budding Italian art. From this moment the influence of paganism will make itself felt everywhere. In sculpture we instantly find traces of it in the "Faune," which was the maiden work of Michael Angelo, the faune being one of the subjects of Greek

mythology most frequently selected by an artist; in painting, also, it sparkles a little everywhere, and especially in the mythological pages which figure in the midst of the religious themes which Michael Angelo and Raphael chose for the ornamenting of the greatest monument of the Catholic world. Sanzio feels his genius in the full volume of its plenitude only after having contemplated the "Three Graces" at Sienna, and this symbol so struck him, he was so vividly impressed by it, that he returns thither often with marked willingness and loves to do so repeatedly. The pagan classicism gains the upper hand: it has such irresistible traits, invincible seductions, mysterious garbs, intoxicating charms, such subjugating perfections. It pierces through every effort. In the full effervescence of religious feeling, in the fervor and ecstasy of triumphant faith, sweet and consoling, even there where the single-hearted artist endeavors to express a feeling of devotion, to paint the smiling goodness of the "Madonna," to represent the tragedy of the "Passion," to describe the tragic terrors of the "Last Judgment," there often starts up the radiant exuberance of pagan beauty, luxury, pomp, nudity, passion, the splendors of pagan art; so much so that Pope Adrian VI, that poor monk from Utrecht, summoned by a strange caprice of the Conclave to succeed Leo X, feels himself completely expatriated on his arrival, finding himself amidst this irruption of worldly figures, this collection of paintings of which the profane style is aggravated by the profuse use of gilding; and, at the sight of these saints with muscles like gladiators, these Virgins whose holy maternity preserves under the too-abundant flesh a penetrating perfume of sensuality, and these prophets who have every appearance of flirting with the sibyls, his monastic simplicity is disconcerted, and he cries out in his fright, "*Sunt idola diabolica!*"

Paganism runs through every vein of the Renaissance, which, born at Pisa with the discovery of the Greek bas-reliefs, exhales, five centuries afterwards, its last breath on the lips of the "Venus" of Canova. Michael Angelo and Raphael drank at this source; Leonardo da Vinci alone passed beside it without wetting his lips in it; he felt its freshness, he admired its purity, but he passed by on the other side. His artistic dream carried him towards another source of inspiration, more fruitful and more human.

Michael Angelo was born in 1457 near Arezzo, in that smiling country of the Casentino which witnessed the birth of so many great men; we will not place much stress upon the question of knowing whether through his connection with the family of the Counts of Canossa he was in very truth a descendant from the royal stem; that would add nothing to his glory. We incline, rather, to take the negative view. We have seen bankers and wool-merchants, like the Medicis, attain to a degree of power that was almost royal; we have rarely seen princes creating *chefs d'œuvre*, unless one is willing to consider as such the verses which Frederic the Great of Prussia sent to Voltaire. The infancy of Buonarroti flowed easily and happily by, although his father was not rich. He at first studied grammar and poetry, then, his artistic vocation declaring itself in an imperative manner, so to speak, his father, who considered this vocation as a derogation, decided, though against his will, to apprentice him to Domenico Ghirlandajo, the painter of the magnificent frescos in Santa Maria Novella; he was then fourteen years old. In a very short time he knew more than his master, and, shortly after, entered the service of Lorenzo de' Medici, who wished to found a school of sculpture capable of continuing the brilliant traditions of Donatello and Ghiberti, not long dead. To this end, Lorenzo had collected in the gardens of St. Mark's fragments and antique statues. And here it was that Michael Angelo began to live in the familiarity of some of the most beautiful models of Classic beauty. It was at this time that he modelled the famous "Faun's Head."

With Buonarroti began the third great group of the Renaissance, the first of which was formed by Dante, Giotto and Orcagna. In following out the transformations of art through generations which at a short distance followed one another, we can very clearly detect the influence which the awakening of paganism exercised on Italian genius. The first group, which proceeded directly from the Middle Ages, still preserves the sorrowful and severe character of that epoch. Dante's poem is a sombre tragedy, and the works of Giotto and Orcagna are tragedies of painting, tragedies whose ferocious and primitive naturalness is pushed to the farthest extreme; the second group, formed by Masaccio, Donatello, Brunelleschi, Ghiberti and Petrarch, is already more lovable; its creations have more of grace and less of melancholy. Petrarch is an Epicurean poet who sings deliciously of love on the banks of rivulets and under the shade of laurel trees; Masaccio, in the frescos of Sta. Maria del Carmine, begins to deprive painting of its archaic prejudices, and courageously attacks the nude, rehabilitating the flesh, stigmatized and condemned by the superstitions of the preceding centuries — the human body, which had been stricken with decay by Catholic contrition, and which, under the naves of the churches, reappears triumphant, purified by means of the sublimity of expression given it by the grand interpreters of art.

On his side, Brunelleschi, at Santa Maria del Fiore, was fixing the formula of Italian architecture, in which the Gothic style, imported by the Germans, is no more than the skeleton, the modified framework, embellished, refined, rendered appropriate to the climate, subjected to the laws of a genius of greater delicacy, and upon which Italian art embroiders original creations, causing its own dream to blossom and bloom, thus creating a national style. Michael Angelo

and Raphael were the two chiefs of the last group by which Classicism was to attain its full expansion in Christian art, and after which the mists of the decadence began to appear.

Michael Angelo was treated with the greatest benevolence by Lorenzo de' Medici, who knew how to gild the chains in which he had imprisoned the liberty of the Florentines and desired to surround his absolute power with those amiable and seductive forms which alone could make it endurable by a corrupt democracy. In the midst of his abasement, the democratic Florentine sought to preserve the appearance of his pride, and could only abdicate into the hands of a man capable of impressing on his authority a character of intellectual grandeur and Athenian mildness. A harsh and narrow-minded tyranny, analogous to that of Bentivoglio at Bologna, or to that of the Sforzas at Milan, it was impossible to establish on the ruins of a republic which, like that of Florence, had exercised a real sovereignty and had habituated the people to believe themselves masters of their own destinies, even when they had ceased to be so. It is considered one of the merits of Louis XIV to have once allowed Molière to sit at his table: two centuries before, Michael Angelo, still young, and whose glory was hardly yet born, sat almost every day at Lorenzo's table without being subjected to the rules of ceremony, which placed the guests, in relation to their host, in a position of inferiority, almost servitude, a fashion which was followed at the court of the "great king."

Michael Angelo was a slow worker, but patient and tireless. Everywhere he went he left traces of his laborious fecundity. The real monuments of his genius are the tomb of Julius II—which was the nightmare of his existence, and has remained unfinished—the Sistine chapel, the tomb of the Medici; it is particularly in these works that glows the full power of his imagination and is manifested his knowledge and technical mastery. In the other works which he left we can discover the influence which Classic studies exerted on his mind. Living in an atmosphere whose secret springs conspired to turn to the profit of religion all artistic manifestations, he withdraws himself from these occult forces, and his mind returns with persistence towards subjects which permit him to enter into communion with pagan antiquity; the "Centaur," "Sleeping Cupid," "Bacchus," "Torso of Hercules," "Adonis," "The Fall of Phaeton," are so many acts of revolt which, under pretence of weariness and dilettanteism, he opposes to the tyranny which religious fanaticism sought to exercise over the Renaissance. But it is especially in the works which are the milestones of his glorious career that we can perceive the persistence with which his talent submitted to the charm of Classic reminiscences and forced itself to subjugate allegories and Catholic legends to the rules of antique beauty and mythological conceptions, even though these works were intended to ornament the most beautiful monuments of Catholicism. In the tomb of Julius II, the statue of Moses has an Olympian attitude and the fierce severity of a pagan divinity: one reads in the features the inspiration of the prophet and the rude inflexibility of the law-giver; but one can also see there the serene grandeur of Olympian Zeus.

The artists of the first generation became subject without revolt to the control of that feeling of sadness and discouragement which flowed from the faith such as it was understood in the Middle Ages, simply because contact with Greek antiquity was denied to them. Pre-occupation with the drama beyond the grave rendered their aspirations sombre, and impressed upon their works a frightfully tragic character; see, for example, the Campo Santo at Pisa. Michael Angelo, on the contrary, never separated the feeling of force from that of grace in his subjects which lent themselves to such conjunction; he seeks the beautiful, Greek beauty before all, and it is he who first, in his "Pieta," dares to give to the mother of Jesus Christ the features of a pure and virginal youth. The theological subtilties by the aid of which he was to explain this new conception of the drama of the Cross are pretexts which do not suffice to justify the real motive which impelled him, that is to say, his determination to bestow grace and seductiveness on the mysteries of religion, a determination which could, after all, be in him only an instinct, a tendency, of the secret source of which he was himself ignorant. The Virgin of the "Pieta" at Bruges and that of the "Pieta" in the sacristy of St. Peter's less resemble the Mother of God, who is sacrificing herself for her young son, than a Greek Niobe who has drawn upon her knees the last of her sons stricken down by the arrows of Diana: in the same way the "David" less resembles a biblical personage than an Apollo.

Before the tombs of the Medici at Florence, the effect of which is so grandiose and impressive, one experiences only feelings that are profoundly human. Mysticism has no part in the conception of this mausoleum, in which Michael Angelo knew was buried the last hopes of Florentine patriotism, and from which exhales a feeling of poignant grief and bitter hopelessness which has nothing of religious sentiment about it. The figure of the Virgin, which the master has sculptured in one corner, finds herself there expatriated, as it were, and wears an air as if altogether astonished at finding herself there. She evidently feels that she is out of place. The allegorical females which represent "Night" and the "Aurora" could never have knelt down before an altar, could never have bowed the forehead before a tabernacle, and are ignorant of the transports of prayer; they are not even Italian women, they are Greeks: Greek in the nobility of their features, Greek in their beauty and the healthfulness of their bodies, and in the strength of their muscles. The two Medici are warriors of antiquity; one of them has a bushy beard, and the other

the harsh and energetic features of the Homeric heroes. The whole air of the monument is clearly worldly and profane; when, in the half-light which bathes these statues, in the solitude which surrounds them, they have been questioned, they have been found living, and one perceives that the feeling of death which ought to rule amidst all these tombs is absent, and one thinks, on the contrary, upon the struggles of which Florence has been the theatre, upon the factional wars, on proscriptions, on massacres; one hears, as it were, the noise of the tocsin calling the people to arms, one sees unrolling before him the drama of Florentine history, the short and tragic alternations between liberty and tyranny, at the end of which the republic falls under the domination of the Medici, now corrupt and degenerate, until the tocsin becomes the funeral knell which accompanies the obsequies of democracy wrapped in the rich shroud which Tuscan genius has embellished, and in which, thanks to the deceitful brilliancy which surrounds its mourning, it can still, like the decayed Athenian democracy, be cradled in the illusion of life and liberty. Here we are not in the presence of the Christian sanctuary, out of which should arise the feeling of the triumphs and reparations beyond the grave; the master wished to present a political and human tragedy, from which all hope of revenge and consolation has been banished with cruel intention, and of which the bloody and sorrowful pages could not have been translated by conventional processes and the forcibly limited canons of religious art. To interpret all the sufferings and all the bitterness with which the soul of Michael Angelo was ulcered, there was necessary this style, freed from all mystic preoccupation, and this is why, out of all the monuments produced by the Renaissance, the tomb of the Medici is perhaps the most pagan and the least pious.

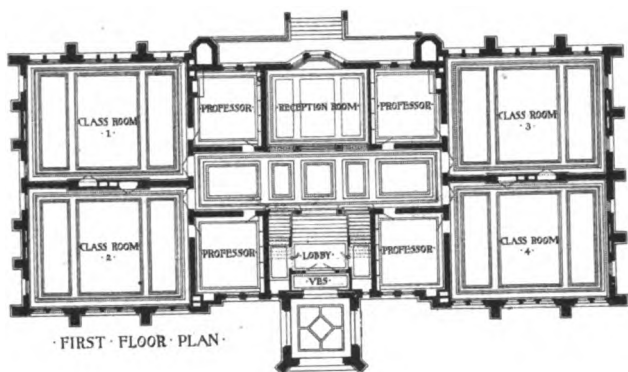
Shall we, by chance, find in the Sistine Chapel the religious feeling which is lacking from the tomb of the Medici? Here, everything should contribute to give free swing to that inspiration, if the genius of Michael Angelo were capable of conceiving it disengaged from the Classic predilection which he so forcibly affirmed elsewhere. This chapel was destined for the celebration of the most august ceremonies of the Christian rite; the *élite* of the prelacy was called to be seated here, surrounded by all the magnificence of the cult, and presided over by the spiritual chief of the Catholic confession; it ought to have been the holy of holies, a place designated for bringing the prayer of the high priest as directly as possible into communion with heaven. At the most, it was begun at a time when the soul of the master had not yet been chafed by the triumph of tyranny over liberty, by the irrecoverable defeat of popular right and democratic justice. One understands the feeling of fierce grief which found expression in the tomb of the Medici, when one thinks that this monument was executed by Michael Angelo under the reign of a vulgar and insignificant tyrant, of that Alessandro de' Medici who himself represented the victory of vice and despotism, and of whom he, Michael Angelo, as the very acme of humiliation, was almost a prisoner: he worked upon his task like a slave over whose head is always suspended the master's sword. God had betrayed the cause of the people and of liberty; this can explain the frame of mind of the citizen and the cry of dumb revolt which breathes from this tomb. But the Sistine Chapel was begun by Michael Angelo when his genius was in the fullness of its youth and bloom: the "Last Judgment" is like the last page of a book written too late, when the thought, ripened by harsh tests, broken by the most cruel deceptions, had no longer either spontaneity, simplicity, happy confidence, optimistic abandon, or the joyous and poetic vision of early days. And yet the two parts of the work hold together, one feels that they are the product of the same brain, and that the same spirit conceived them and animated them. One finds, in the "Last Judgment," more force, more sureness, and more sustained effort after the grandiose, more marked and confirmed intention, but one sees at first glance that all the personages are issued from the same mould, which, with time, has become larger and more ample, in such fashion as to give the attitudes and swollen limbs of giants to creations which were, at first, only of colossal proportions. Now, there is not a single morsel of this prodigious work in which one does not always see sparkle, even through a religious theme, the violent desire of reëndowing art with the charm of Classic beauty, a careful regard for realism through the very exaggeration of real forms. This monument no more than the other is a Christian monument and the proof of it is that if Michael Angelo had lived before the birth of the Messiah, he would have conceived and executed it just as it is; it would have been enough to suppress the figure of the Christ, who dominates the scene of the Resurrection, and to change some of the secondary figures, which are, in fact, merely so much filling, for him to be able to assign to it a date earlier by fifteen centuries and to make it live in an epoch when Christianity was still, so far as humanity is concerned, only a grand hope.

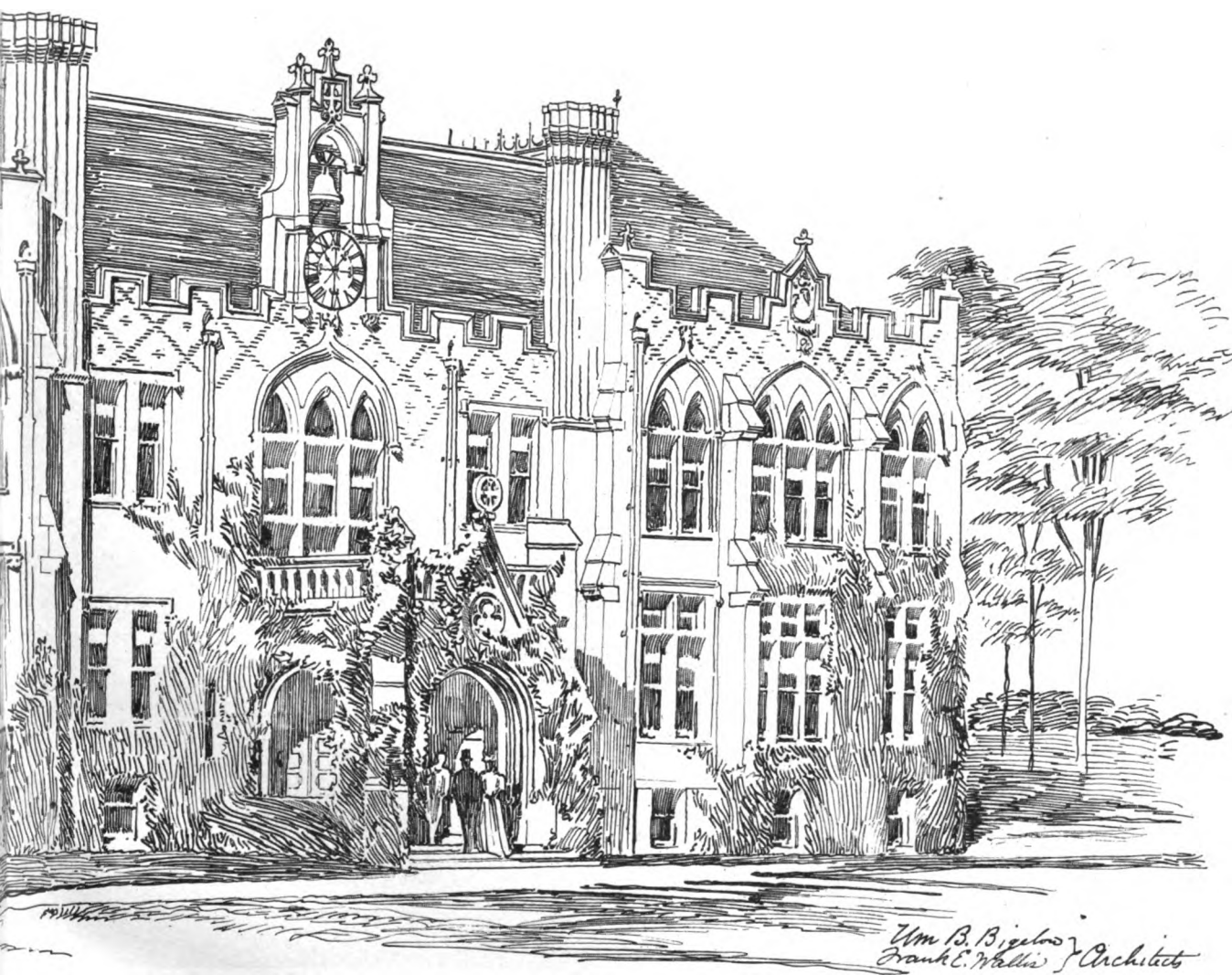
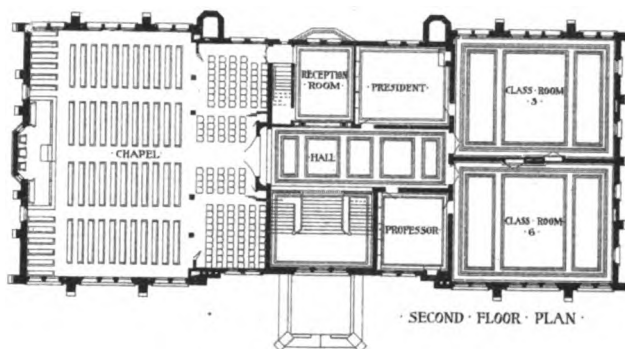
This does not mean to say that Michael Angelo imitated the antique; on the contrary, he repudiated its formulas; he only cared for force, for exaggeration, for the terrible, while the Greeks held particularly to the feeling for measure, and grace and beauty. But at the same time that he withdraws himself from them and by the manner in which he interprets form, he withdraws himself from religious art by the energetic turbulence of realism, by the violence with which he sets about expressing his profoundly human ideas, imprisoning religious symbols in the contours of an essentially realistic technique, by the persistence with which he adheres to the practice of imprinting the character of the human tragedy upon all the features of the biblical and Christian legend, just as the Greeks

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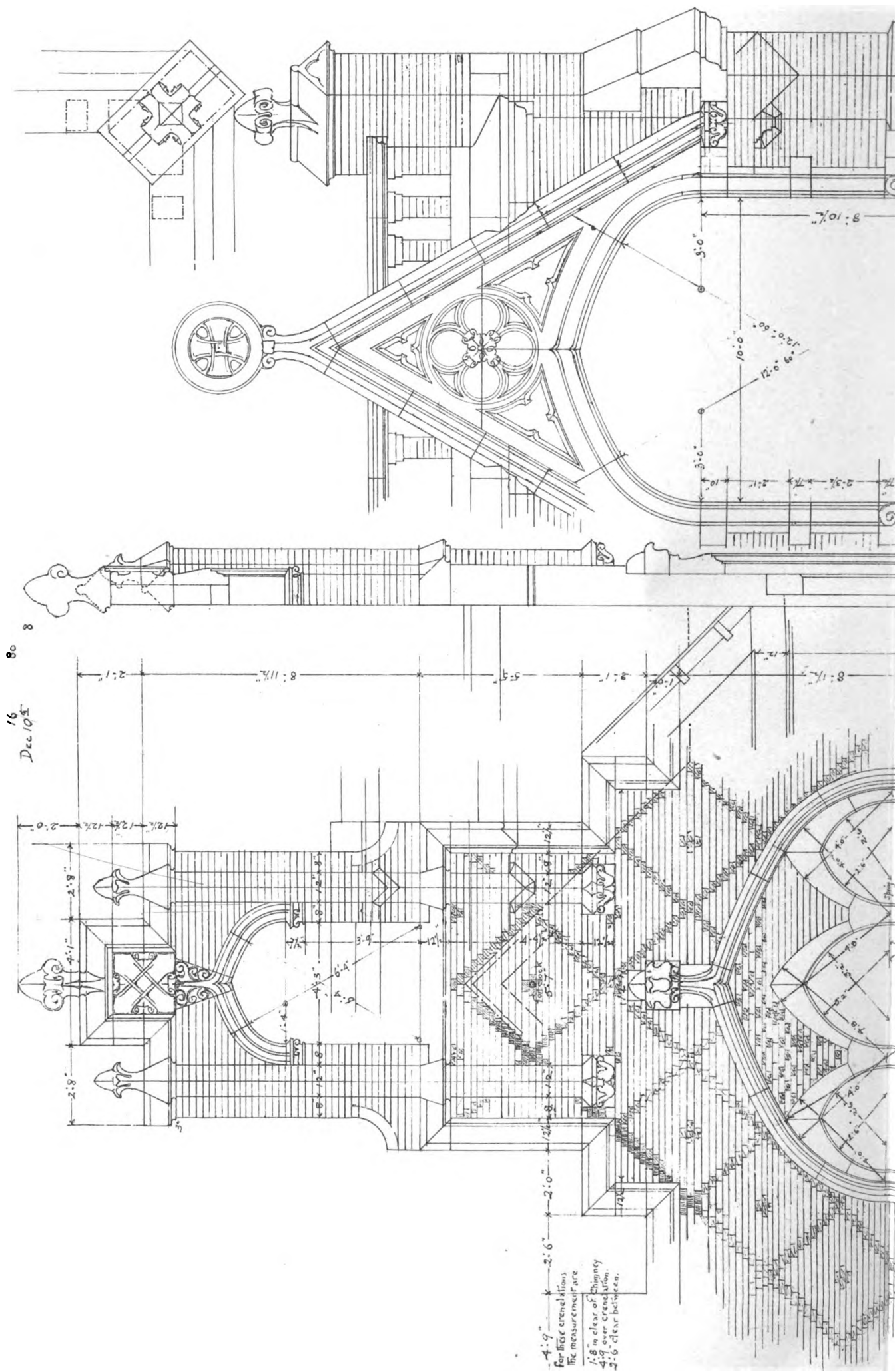
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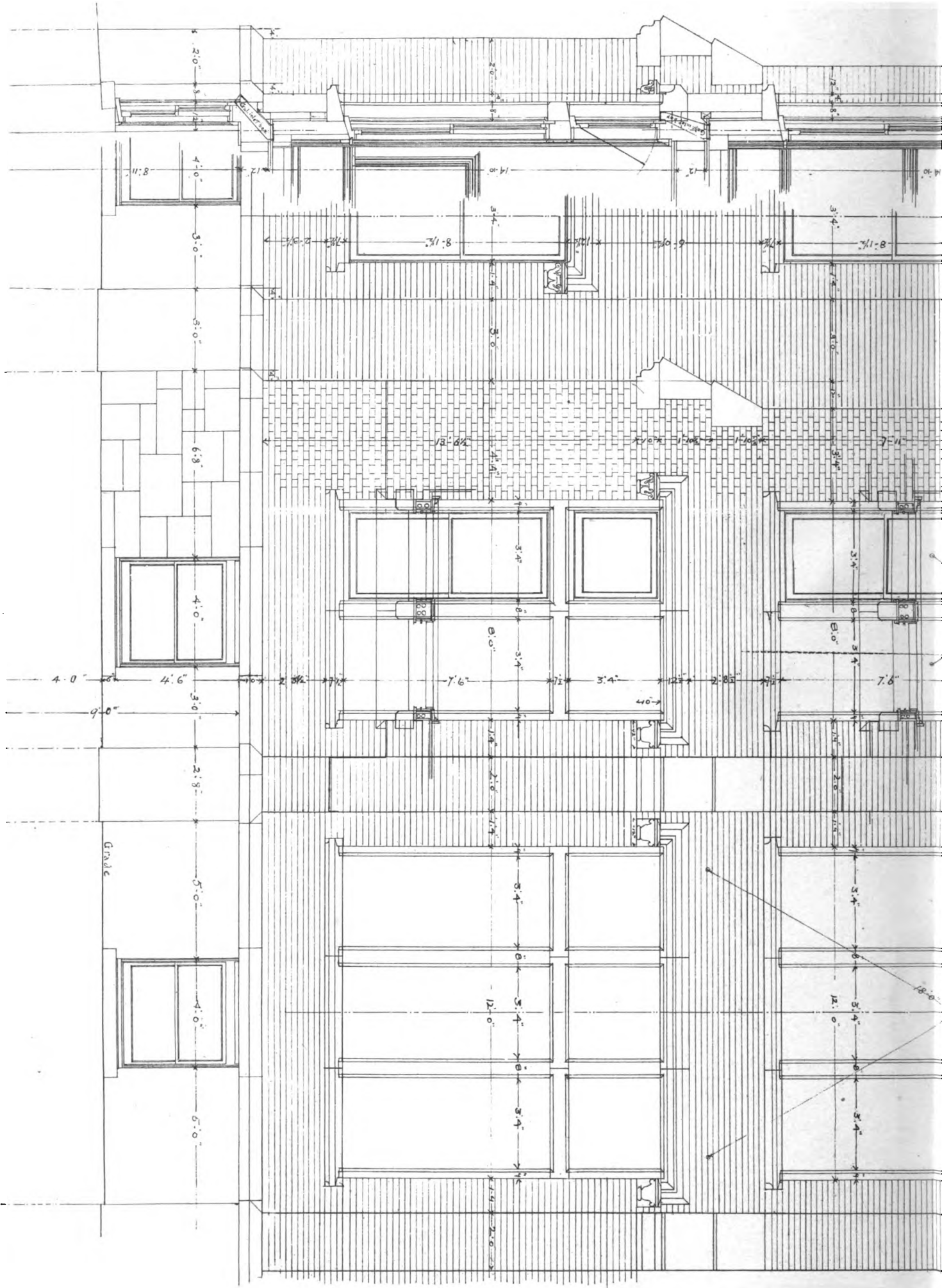
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$\frac{3}{4}$ Scale Detail of Front Porch and Belfry.





DETAILS OF ADMINISTRATION BUILDING: DREW THEOLOGICAL SEMINARY, MADISON, N. J.
W. B. BIGELOW & F. E. WALLIS, ARCHITECTS.

REPRODUCED FROM THE ORIGINAL DRAWING

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preferred to lend human feelings and human physiognomies to the Olympian gods; and it is precisely in this way that Michael Angelo, in withdrawing himself from religious art, came nearer again to Greek art, although he pretended not to follow its technique servilely, a technique affected, too delicate, too precise, too amiable to be agreeable to his haughty and headstrong temperament.

Thus, everywhere, in this colossal work, we see the traditions of paganism jumbled in with the mystic imaginings of Christianity; we see the heroes of the fables of mythology rubbing elbows with personages who controlled the Mosaic odyssey and peopled the New Testament; we see the sibyl seated by the side of the prophets, about scenes in which is enclosed the poem of the creation; we see Jeremiah chanting his despair at the side of the Persian woman, tied out with his search for the inexplicable and unfindable; Daniel, vomiting forth his imprecations at the side of the Erythraean, passive in his wisdom; Joel announcing the final judgment, and Nahum turning over the leaves of his book side by side with the prophetic sibyl, absorbed in strange visions; Isaiah presenting the joys of Redemption, side by side with the Cumæan sibyl, sun-burned and wrinkled, bowed down under the harsh stroke of fatality; Daniel, young and smiling, his spirit haunted by oracles, and Jonas, who reproaches God for having spared Ninevah, Jonas the implacable, side by side with the Libyan woman, whose intellectual forehead, serene and contemplative eye, and smiling mouth, indicate his pre-eminence for poetry.

From this brutal mixture exhales an impression, rises a feeling which is not Christian; we forget the drama of the Redemption, we are penetrated by the grandeur of all the traditions of humanity, of the legends of the origin of the world, of the poem of life whose pages unrolled before our eyes, and we regard the most touching episodes, the most terrible and problematic traditions, the most terrifying remembrances, the most poetical hypotheses, all the errors, in a word, all the revelations, all the dreams, all the fictions which the imagination of man has conceived, as explaining life, its source, its reason and its end. All the religions, all the beliefs are here associated to compose the grand book in which are noted down the uncertainties, sufferings, visions, the illusions, the torments, and the searchings through which the spirit of humanity has passed in its endeavor to understand itself.

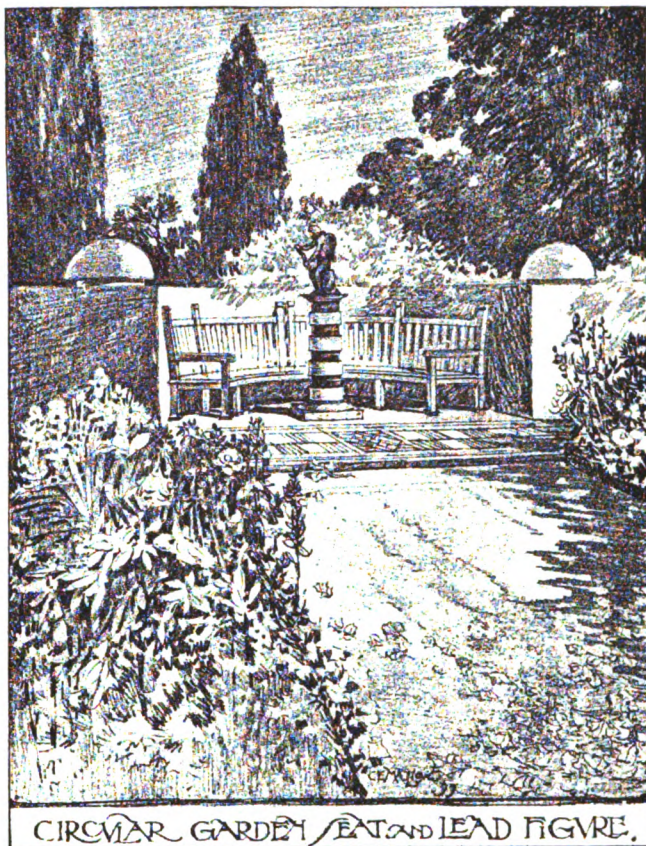
For the rest, an observer whose penetration is beyond question, M. Taine, who must often be cited when one reasons about this subject — for he is the Michael Angelo of the criticism of history and art, to which he brings the same feeling of sorrow, discouragement and cruel disheartenment — has already remarked and noted the spiritual relationship, so to call it, which exists between some of the personages in the Sistine Chapel and the types illustrated by Greek art. And his testimony is all the more convincing since he speaks of it from another point-of-view than ours, and in a manner wholly objective. "The Erythraean woman," he says, "is a Pallas more warlike and more haughty than her Athenian sister." Farther on, he adds: "Nature has produced nothing equal to it; it is in this woman that she ought to have treated us; she could find here all the types; by the side of giants and heroes, virgins, adolescent youths, youths; this charming Eve, so bright and beautiful; this beautiful prophetic girl, the equal of a primitive nymph, who gazes out of a full of naive astonishment; all boys or girls of a colossal and stately race, but in whom their age preserves the smile, the serenity, the simple joy, the grace of the Oceanides of Eschylus and the Nausicaa of Homer." Already, apropos of the symbolical women which ornament the tomb of the Medici, he had remarked that "they are of another blood than ours: a fallen Diana, captive in the hands of the barbarians, would have had such a figure and countenance." And later, before the "Last Judgment," seeing Christ terrible and vengeful, his scowling countenance looking out over the scene of the Resurrection like a breath of malediction, he calls him the "Christ of the thunderbolt, like Jupiter, who, in Homer, overthrows in the plain below, the Trojans and their chariots." Stendhal, long before Taine, had already written, in speaking of the two mothers placed among those whose salvation is assured, one of whom seems to bend towards her daughter to protect her: "There are only these two figures in the painting which are not transported by terror. This mother, in her attitude, somewhat recalls the Niobe." Let us not insist too much on the incident of Saint Blasius, who forgets the instruments of torture which weigh him down while he casts an indiscreet glance towards Saint Catherine, who is quite nude before him, and who turns herself about, startled and vexed. This is a scurrilous bit of by-play which would not be out of place in a Pompeian painting. They say it is the only slip of the sort that Michael Angelo is guilty of. Yes, but all things which issue from his gigantic imagination are violent and *outré*.

The lower regions, which forms one of the most noticeable portions of the "Last Judgment," is not a Christian hell, where the damned perpetually expiate their sins in the midst of flames; it is a pagan hell, where the condemned are called upon to live over again a life of sorrow and suffering. We find Charon, old and avaricious, guiding his bark over the black waves of Acheron, and long files of the condemned unroll themselves along the brink of the river, sombre as a mourning wreath, and so little does one place them that he imagines that, in order to overcome the avarice of the terrible boatman, they are going to offer him the money which charitable relations have slipped into their mouths at the moment

when they were placed in their tombs. One thinks for a moment of the "Last Judgment" by Signorelli, in the Cathedral of Orvieto, where the Styx flows, mournful and sluggish, through the midst of a people blasted by punishment, and we find here figures which we have already seen in Signorelli's fresco, which Michael Angelo had attentively studied. But it is better not to lay stress on certain resemblances or analogies which only prove that Michael Angelo, without plunging into plagiarism, knew how to take his profit where he could find it.

H. MEREU.

XYLOSOTE.



From *Building News*.

GREAT progress has been made in the past few years in wood impregnation, none of the methods, however, hitherto employed having altogether fulfilled their expectation.

The processes chiefly in use during the past 50 or 60 years — namely, Kyanising, Burnettising and Creosoting — or combinations and variations of these, each possessed some good feature, but all had nevertheless, faults. These faults are and have been well-known for many years, and careful studies were made to overcome them.

The most serious difficulty to master or overcome was to find means thoroughly and evenly to penetrate wood with the preservative agent, and then to keep it there. The slight penetration obtained by processes formerly in use preserved only a thin outer skin of the wood. If this skin was damaged or broken by driving a spike, or otherwise, it exposed the interior or untreated portion to moisture, etc., whilst again preventing its drying out quickly, and this caused rapid decay, as is the case with other systems.

In another process the preserving agent is chloride-of-zinc, mechanically deposited in the cells and sap ducts in the shape of crystals from a water solution. These crystals still remain soluble in water, and so are again as readily washed out by the action of rain or water, leaving the wood unprotected, proved by examinations of many railway-sleepers thus treated in Germany. After a few years, no traces of zinc were found. These are the two greatest faults of the processes that had heretofore given the best satisfaction.

Some 24 years ago a German engineer and architect, Mr. Fritz Hasselmann, undertook to solve this problem, and from all indications and experiment he has successfully done so. The result of his many years of study, experimenting and investigations is a process, patented in all countries, which consists in boiling the wood in a solution of metallic and mineral salts under limited pressure. The impregnating liquid consists of a solution of (about 45lb.) sulphates of copper and iron (crystallized together in the proportion of 20 per cent of copper to 80 per cent of iron) and alumina and "Kanit," a salt mined at Stassfurt, Germany, consisting chiefly of sulphate of potassa and magnesia and the chloride-of-magnesia.

The proportion of these salts used, the temperature to which the liquid is raised, the time of boiling, as well as the pressure generated, vary with the character, age, nature and general condition of the wood to be treated. It is a well-known and conceded fact that the

seen only by reflected light. The theory of Wiener as to the production of colored images with silver compounds does not hold good in regard to these colored images in bichromated gelatine because in this latter there are no silver layers, and Wiener's theory is based on the fact that the superimposed and reflecting layers of silver in the film are the cause of the colors. One must thus conclude that the colors are caused by reflection from fine films of unchanged gelatine.

The basis of the various indirect processes of color-photography is the production of three negatives by means of three different light-filters — three plates sensitive to red, yellow and blue. With these three negatives polychrome prints can be made in various ways.

De Rausonet proposed to make three negatives by means of yellow, blue and red filters, from these three lithographic stones, and to afterwards print in the appropriate colors by lithography. But this process did not give good results, for, though the negatives were taken through colored screens, the plates were not specially sensitive to the different colors. Dr. Hauron's process suffered from the same defect. He printed from his negatives in carbon, and transferred to plates of mica.

When Vogel invented color-sensitive plates, Drs. Albert and Obernetter were the first to succeed with tricolor reproduction.

But there are still many difficulties to overcome. The problem of the selection of the proper blue, yellow and red colors is one; these three colors must be such as shall give every other by admixture, a condition which at present cannot be fulfilled. As a matter of fact, the same three colors should be used both for sensitising and printing, a very practical difficulty, for most sensitisers are useless for printing purposes. Hence recourse must be had to those colors which lend themselves to the printer's art, and hence, although extremely beautiful reproductions are made, fac-simile representations of the originals are, at present, not possible. Still, there is no occasion to despair. Wonderful progress has already been made, thanks to the researches of, amongst others, Dr. Vogel, Baron Hübl, Frisch, Husnik, and Angerer. Before leaving photo-mechanical color processes, mention must be made of the synchromotypes of Turati, which are obtained by means of a press constructed by Turati himself, and with which only a single impression is required to give all the colors.

Amongst non-photo-mechanical processes, that of Ives led the way in viewing three images at one time. His apparatus simply consists of a lens through which the rays of light fall on one plate directly, and on two others by reflection. Each plate is provided with a suitable screen, and the positives thus printed from the negatives thus obtained are viewed against the glasses corresponding to the taking screens.

Vidal projects the three positives onto a screen. Nachet adopts Ives's arrangements, using stereoscopic apparatus. Selle makes three positives on collodion films, which he dyes red, blue and yellow respectively. They are then superimposed and projected.

Joly uses the idea of McDonough, taking a single view through a ruled screen of colored bands, red, green and blue, repeated across the plate. The result is a negative of very fine lines. A positive is made from this and placed in contact with a screen similar to that used in the camera, line to line.

Stockert's process possesses much of interest. From each of the negatives made, as for the tricolor process, a print is taken in gum-bichromate, the first for the yellow, the second for the red, and the third for blue. The three prints are made on the same paper, one on top of the others, sensitising twice more after the first printing.

Lumière similarly uses carbon. Hofmann has a similar process, in which the preparation of the negatives and registration of the prints is assisted by ingeniously devised apparatus.



ARCHITECTURAL LEAGUE OF AMERICA.

THE second monthly meeting of the Executive Board of the Architectural League of America was held August 7, 1900. There were present Joseph C. Llewellyn, *President*; Richard E. Schmidt, *Vice-President*; August C. Wilmanns, *Treasurer*; Emil Lorch, *Corresponding Secretary*; Hugh M. G. Garden, *Recording Secretary*; and Prof. Newton A. Wells and Robert C. Spencer, Jr., *Members of the Board*.

The chief business transacted was the assignment of the Standing Committees of the League as follows:—

Publicity and Promotion, The Chicago Architectural Club; *Ethics and Competition Code*, The Architectural League of New York; *Exhibition Circuit*, The Cleveland Architectural Club; *Foreign Exhibit*, The T-Square Club, Philadelphia; *Current Club Work*, The St. Louis Architectural Club.

The Committee on Education will be appointed at a later date. The monthly meeting of the Executive Board is held the first Tuesday of each month at five o'clock at 1218 Association Building, Chicago.

EMIL LORCH, *Corresponding Secretary*.



[Contributors of drawings are requested to send also plans and a full and adequate description of the buildings, including a statement of cost.]

ADMINISTRATION BUILDING AND CHAPEL, DREW THEOLOGICAL SEMINARY, MADISON, N. J. MESSRS. W. B. BIGELOW & F. E. WALLIS, ARCHITECTS.

DETAILS OF ADMINISTRATION BUILDING: TWO PLATES.

[The following named illustrations may be found by reference to our advertising pages.]

CONVENT OF THE ORDER OF CHRIST, THOMAR, PORTUGAL.

This plate is copied from *Teknisk Tidskrift*.

HOTEL ON THE AVENUE D'JENA, PARIS. M. SCHOELLKOPF, ARCHITECT.

This plate is copied from *La Construction Moderne*.

A CORNER OF ST. MARK'S, VENICE. DRAWN BY W. CURTIS GREEN.

This plate is copied from *The Builder*.

[Additional Illustrations in the International Edition.]

PALATIAL RESIDENCE, BAMBERG, BAVARIA.

[Gelatine Print.]

THE imposing edifice, of which our plate shows the middle axis and two side axes of the central resault, was erected on-Atte Judengasse, Bamberg, as a private residence for J. J. J. Boettinger, archivist of the bishopric, a wealthy and art-loving citizen of the old Bavarian city. It was completed in 1680. Johann Leonhard Dientzenhofer, a renowned architect of his age, the designer of Banz and Ebrach Abbeys, Pommersfelde Castle and other noted edifices, drew the plans for this city-residence, which in its richness might have served a princely occupant for his abode. The building shows distinctly the peculiar manner of its designer, who appears to have studied the Barocco structures of the Italian cities, for he imitated them with intelligence, although he would translate their dainty and delicate forms into heavier, sometimes almost clumsy shapes, as will be seen by a glance at the arched entrance and the frontals over the windows of the third story. By the general weightiness of his widely projecting cornices and of his profiles, Dientzenhofer reminds one of the work of another noted master of that epoch, the famous Balthasar Neumann, who created the magnificent staircase of Schloss Brühl, on the Rhine, the beautiful Schoenborn Mortuary Chapel² attached to the Cathedral, Würzburg, as well as numerous other fine structures, although in the general harmony and the well-balanced proportions of its parts to the whole of a façade, Dientzenhofer does not equal the last-named architect.

DESIGN FOR THE NEW SESSIONS HOUSE, OLD BAILEY: PERSPECTIVE VIEW. BY MR. F. T. BAGGALLAY, F. R. I. B. A.

"SHILLINGFORD HILL," BERKSHIRE: STAIRCASE WING. GEORGE HORNBLLOWER, F. R. I. B. A., ARCHITECT.

"SHILLINGFORD HILL," BERKSHIRE: THE LODGE. GEORGE HORNBLLOWER, F. R. I. B. A., ARCHITECT.

INTERIOR VIEW OF CHAPEL: ADMINISTRATION BUILDING, DREW THEOLOGICAL SEMINARY, MADISON, N. J. MESSRS. W. B. BIGELOW & F. E. WALLIS, ARCHITECTS.

DETAILS OF THE SAME.



LARGE POWER-INSTALLATION IN SWEDEN. — A large installation for transmission of power has been constructed at the Trangfors waterfall at Västmanland, Sweden. The Kolböck River there forms a waterfall of about thirty-three feet in height, and the installation comprises six quadruple turbines with horizontal shafts, each of 300 effective horsepower, with 250 revolutions per minute. The shafts are direct-coupled with the electric-generators. The whole river has been dammed, and

¹ See the *American Architect*, No. 1172, June 11, 1898.

² See the *American Architect*, No. 1191, October 22, 1898.

from its north side the water passes through a canal 1,130 feet long, 23 feet broad at bottom, with 8 feet depth of water, and sloping sides to the power-station, which is 113 feet long and 50 feet wide. The floor of the engine-room is 10 feet above the lower surface of the water, and the shafts of the turbines are located 4 feet above the floor. The turbines are radial, each with four wheels of 700 millimetres in diameter. The water is led to the turbines through three pipes of 8 feet in diameter. At the end of each tube is a small turbine for working the exciters, which are common for the two generators. These turbines also have horizontal axes, and are each of 25 effective horse-power with 560 revolutions per minute; they are otherwise of the same construction as the larger ones, and direct-coupled with the exciters. These turbines utilize from 60 to 80 per cent of the natural power. The current from all six generators is collected and afterwards conveyed to 18 transformers, where the tension is raised from 800 to 14,000 volts. The transmitting line consists of three 6.75-millimetre copper-wires, supported by porcelain insulators attached to poles placed at a distance of 168 feet; the poles are of a height making the minimum distance from the lowest wire to the ground 27 feet; lightning dischargers are placed at both ends of the line. On reaching the boundaries up the town of Vesteraas, a distance of some fourteen miles, the tension is again reduced through the same number and size of transformers, and distributed to the various consumers. The Northern Metal Company heads the list of the consumers, their new works requiring no less than nine hundred horse-power, divided among 14 motors, varying from three hundred to four hundred horse-power capacity. The motors are all inductive, and the large ones are principally used for the working of rolling-mills. Special and thoroughly practical appliances have been installed for facilitating the starting of these heavy motors. The works of the General Swedish Electric Company receive 300 horse-power, part of which current is used for direct driving of inductive motors, while another portion is transformed in portable transformers to work a large number of small motors. The power-station belongs to the Trangfors Power Company. The water-power and the site of the station have been leased for a period of 50 years from the owners, the Hallstahammar Company, Limited. — *Engineering*.

THE HOTEL DE RAMBOUILLET.—Two blocks of granite in the Musée de Cluny, in Paris, are all that now remain of the famous Hôtel de Rambouillet, which flourished during the early part of the seventeenth century. Historians credit the Marquise de Rambouillet with having founded the first *salon* known in Paris. She had the gift of social organization, and, in addition, was herself an attractive woman, well-bred, talented, beautiful, and rich; above all, she was a good and virtuous woman, which in the days when profligacy and vice held sway at the French court is no small praise. Maitre Charles d'Angennes, Marquise de Rambouillet and Pisani, was twenty-three years of age when he married Catherine de Vivonne, eleven years his junior. They had been married eighteen years before the Hôtel de Rambouillet was built. Here gathered the culture and wit of Paris, and serious discussions were carried on regarding all conceivable topics, from literature to war, from poetry and art to grammar and etymology. Besides being the first, it was undoubtedly the best of the many *salons* for which France has grown famous, and for more than forty years it held its place of social supremacy. The original mansion was the property of the Marquise's father, and was known as the Hôtel de Pisani. In 1600 it received the name by which it afterward became famous. The Marquise was her own architect, and made radical changes and improvements in the house from time to time. It was she who first dared to change the position of the staircase, which up to that time had occupied the best position in a house. She banished it to a corner and built it in a graceful and easily ascended curve. She also divided the large and dreary drawing-room into a series of smaller apartments upon the same floor, so that a guest, instead of being lost in a vast and oppressively majestic apartment, made his way to the hostess's presence through a succession of charming antechambers and cabinets. Her particular *salon* was tapestried in blue, and was to become famous both in her time and later as the "blue room," wherein became focussed that type of elegance and refinement which the Marquise and her friends represented. Malherbe, as was the custom of the day, rechristened the Marquise "Arthénice," an anagram of Catherine, and to be received in "the blue room of Arthénice" was an honor which almost conferred distinction. — *N. Y. Times*.

A NEW PROCESS OF WELDING PIPES.—At the congress of the Saxon associations of engineers and architects just held at Leipsic, says the Report of the United States Consul-General at Frankfurt, Max Schiemann, of Dresden, gave a lecture, accompanied by experiments, on "Goldschmidt Process for Obtaining High Temperatures and Its Practical Application." He compared this new process with those hitherto used for heating metals for welding. He showed by experiments the new method of welding cast-iron gas-pipes of from two to four inches in diameter, and demonstrated the very simple application of the process and its result. Briefly stated, it consists in mixing powdered aluminum with oxide-of-iron and adding to it an easily ignitable substance. This powder is put into a clay crucible and then ignited by means of a match. The resulting chemical action renders the mixture liquid, and this liquid is then poured around the place to be welded. The object assumes a white heat, and the welding is done by a very simple apparatus. The welded places show the same firmness as the original piece, and manifold application of the method is possible. In the near future it is proposed to weld the rails of the electric tramway at Dresden, which has already been done in other cities. The speaker welded rails before the audience, and the experiments were pronounced successful, especially on account of the simplicity of the process. It is considered an important discovery, and great hopes are entertained for it. — *Exchange*.

LARGE CHINESE FIGURE OF BUDDHA.—"Up country" from Hong-kong there is a big Buddhist monastery full of monks, or *bonzes*, as

the Chinese call them. And out in the open air before the monastery is its great attraction—an image of Buddha 150 feet in height. The image—it is perhaps not quite right to call it an idol, though to all but the most learned Buddhists the images of Gautama Buddha are practically idols—is what is known as a monolith. That is, it is cut out of a single block of a species of marble. Even the Egyptians seldom made their monolith gods more than half as high as this Chinese Buddha, which, as far as is yet known, holds the record for magnitude among idols. There are many patterns of Buddha images, some of them very ugly and fantastic, but the Chinese giant, notwithstanding its size, is one of the pleasantest and best molded. The face is bland and gentle, even cheerful. On the forehead is a carved ornament of rock-crystal some 3 feet in diameter. The scarf around the neck is remarkably like the stole of an Anglican clergyman. No awful sacrifices are offered upon the (relatively) small altar, which stands before the image—nothing but flowers or fruit. Japan possesses a colossal Buddha, but this is only 60 feet in height and under a temple roof, which apparently adds to its altitude. The Chinese Buddha suffers from being in the open, yet it is able to dwarf completely the figures of the worshippers; placed in Trafalgar Square, it would rival the Nelson column—and astonish the Londoners. — *London Express*.

TREE-FELLING BY ELECTRICITY.—In one of the Western cities a large tree was so injured by a recent storm that it was decided to cut it down, and as it was too large to use a cross-cut saw, workmen were about to go at it with an axe, a most laborious process under the circumstances. An electrician proposed to have it cut down by electricity, and the suggestion was adopted. Connection was made with an arc-lamp circuit near the tree, but this was found to give too little current, and the next day a pair of No. 2 weather-proof wires were attached to the nearest underground feeder, and a 20-foot piece of No. 16 seven-strand galvanized-iron wire was inserted in the circuit, three of the strands being taken out to give air-space and allow the products of combustion to pass. The feeder was cut out of the regular circuit, and a small dynamo attached, with a series of signals arranged between the men at work on the tree and the dynamo-tender. The wire was then wound around the tree and the dynamo started. In a few minutes the wire began to get hot, and then the men began moving it back and forth around the tree, so that in an hour the cut was 18 inches deep. At the end of two hours and ten minutes the cut was so deep that the tree fell. The tree was an elm, and was 11 feet in circumference. — *Exchange*.

ICE-FORMATION IN HOT WEATHER.—Hundreds of people are visiting a hole in the side of the mountain near Coudersport, in Potter County, which must be a delightful place in hot weather. The hole was dug by a man in search of mineral wealth. The farther he dug the colder became the atmosphere. At the depth of 20 feet he was compelled to quit. The peculiarity of this mine is that about May ice begins to form in it, and continues to freeze until October. There is no ice in the hole in winter. The warmer the day, the more ice there is in the mine. On approaching the opening on a hot day, a strong current of cold air is felt. This air becomes more frigid the closer one goes to the cavern. There is no water in the bottom of the shaft, but the water dripping down from its sides freezes. The ice begins to form less than a foot from the top and coats the sides of the shaft several inches thick. What causes the intense cold and where the air comes from are questions that have not been satisfactorily answered. — *Philadelphia Press*.

ACCURATE TUNNELLING.—The longest separate length of tunnel for the recently opened Central London Railway driven was from the Westbourne shaft to the Marble Arch shaft, the distance being over 1,200 yards, and the work resulted in an error of but five-eighths of an inch at the point where a junction was effected with the tunnel driven by another firm of contractors. In two of the sections bore-holes were put down into the tunnel for the purpose of testing the lines, but generally the lengths were driven through so accurately that no recourse to bore-holes was found necessary. — *The Builder*.

MEMORIAL OF KING ALFRED THE GREAT.—The Mansion-house Committee announce that the contract with Mr. Hamo Thornycroft, R. A., for the colossal statue of King Alfred the Great has been entered into, and the work will be completed by midsummer next. The full-sized model in clay has already been finished. The statue itself measures 14 feet from the crown to the feet. The figure of the king is represented standing with one arm resting on his shield, the other held aloft, the hand grasping his sword so that the cross hilt is held uppermost. The pedestal, of rough-hewn granite, is a single block, will be over 20 feet high, and will weigh close on 40 tons. About £4,448 has already been received or promised towards the memorial, and £2,000 more is required. Subscriptions may be sent to the Lord Mayor at the Mansion-house, to the principal banks, or to Mr. Alfred Bowker, the Honorable Secretary, King Alfred Commemoration Fund, Guildhall, Winchester. — *Journal of the Society of Arts*.

AWARDS FOR PAINTING AND DRAWING AT THE PARIS FAIR.—The Exposition awards for Painting and Drawing are as follows: Grands Prix—Benjamin Constant, Casin, Dagnan-Bouveret, Harpignies, Hebert, Henner, Henri Matet, Morot, Roll, Vollon, France; Lenkach, Germany; Klimt, Austria; Stevens, Struys, Belgium; Kroyer, Denmark; Sorolla, Spain; Sargent, Whistler, United States; Alma-Tadema, Orchardson, Great Britain; Boldini, Italy; Thaulow, Norway; J. Israels, Netherlands; Serov, Russia; Zorn, Sweden; Denezun, Hungary. Gold Medallists—United States, Alexander, Abbey, Miss Cecilia Beaux, Brush, Chase, Homer and Thayer. Silver Medallists—United States, Barrow, Benson, Visbing, Bohm, Bridgman, Clarke, Fromuth, Gay, Gibson, Childe Hassam, Johnston, Keller, Lockwood, MacEwen, Nourse, Reid, Stock, Tanner, Vinton and Walden.

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SUMMARY:—

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FOLLOWING out what seems to be becoming an established custom, the Secretary of the Treasury has divided his invitations to submit designs for the Government building at Indianapolis equally between the representatives of "local talent" and the profession at large, and probably no method could assure better results from the standpoint of the citizen of Indianapolis, who must always have the concrete results before him after the building is erected. The Indiana architects invited are Messrs. Andrews & Martindale, Vonnegut & Bohn, Oscar Bohlen, L. H. Gibson and Adolph Scherrer, of Indianapolis, and Wing & Mahurin, of Fort Wayne. Alien talent is recognized by invitations to Messrs. Eames & Young, of St. Louis; Ferry & Clas, of Milwaukee; J. L. Silsbee, of Chicago; Rankin & Kellogg, of Philadelphia; L. J. Thomas, of Canton, O., and Andrews, Jaques & Rantoul, of Boston. Under such a system, all that the Secretary of the Treasury can do when dealing with local talent is to make the best of it and then make sure that a really careful selection shall be made from amongst the outsiders, and in this case the selection of outsiders has been made with great success, for not only have good men been invited, but they are men of very equivalent worth, and if they alone were concerned the resulting designs should be difficult to choose between, as none is so markedly the better of his fellows as to make any hope of a walk-over for him a possibility. Fortunately, too, most of the Indiana men are in the same class with the outsiders.

DEATH has not dealt kindly with the American sculptor of late—American by courtesy, since many who go by that title are foreign-born, and their talents, if not their training, are in some degree hereditaments in which American influences count for little. In most cases these foreign-born artists have died in the country where their working lives were spent and their fame made, but Carl Rohl-Smith had the fortune to die last week in Copenhagen, where, as he was a Dane, he may have been born. What work of merit the sculptor accomplished before he emigrated to this country we do know, but he was an industrious worker and doubtless left his mark on many buildings, as he was particularly skilful in sculpture of colossal scale applied to architecture. His most successful work of importance in this country was the statue of Franklin in Lincoln Park, Chicago, given by the editor of the *Tribune* of that city to the printing trade. Earlier than this he modelled a figure of the "Defender of the Alamo" for the Alamo monument at Austin, Tex., and a statue of Judge Reid, of the Kentucky Superior Court. Most unfortunately for the sculptor's fame, his name is at present best known through being associated with the scandal involved in the award to him of the competition for the equestrian statue of General Sherman to be erected in the city of Washington. As may be remembered, the Society of the Army of the Tennessee, which had undertaken to erect this memorial, held a limited competition and was understood to

place the matter of selection in the hands of a committee of experts, than whom no better could be chosen. This committee selected four sculptors to take part in the final competition, and Rohl-Smith was not one of these four. The military committee, however, chose to substitute the name of Rohl-Smith for that of W. O. Partridge, and later decided the final competition in his favor in spite of the protest of people familiar with the merits of the case and the formulated objections of the National Sculpture Society. The circumstances of the case were particularly disagreeable and, as was natural, things were said officially by the National Sculpture Society which gave offence to the successful competitor, himself a member in good standing of the complaining Society, with the result that he withdrew his consent that his successful model should be, for the enlightenment of the public, exhibited with the models submitted in the final competition by Messrs. Bartlett, Niehaus and Rhind. Because of this fact the public knows little of the real character of this particular work of his, although this is not likely long to be the case, as we believe the sculptor was in Europe this summer to oversee the casting of his group, for which the completed pedestal has for some time been waiting. We hope that when erected the sculptor's last work will be found to have enough merit to add so largely to its author's fame as to dissociate him from a very unpleasant scandal, and at the same time in some degree palliate and justify the very reprehensible method adopted in placing the execution of the work in his hands.

WE wonder if any one believes that had Chicago undertaken to perpetuate in marble such a public monument as the so-called Dewey Arch, in New York, it would not now have been half finished, and all the sculptors who, with such seeming generosity and public spirit, volunteered their services for the temporary structure, be now busily engaged, hopeful of remunerative gain. We fancy they are rather a disappointed lot of men, those sculptors who lavished time, money, health and life itself on the New York arch, and must regret over and over again that the citizens of New York do not have a little of that local pride which makes Chicago ideas take concrete form. It is said that those who undertook to procure funds to provide for the rebuilding of the arch in marble are ready to abandon their undertaking, although the amount of money sought—ridiculously inadequate for the intended purpose—is only half a million dollars. It is fair to assume, however, that if it could be determined where the permanent structure should stand it would not be difficult to secure the balance of the money, some three hundred thousand dollars, which is as yet unpledged. Meanwhile the condition of the temporary structure is growing to be such that in the view of many it is becoming an eyesore, but, oddly enough, that which offends these critics is the staining and discoloration of the white plaster surface. It would probably surprise these critics to take them to some of the dirty and dingy looking bank and insurance buildings about the city and make them understand that these, too, were once fair with the white gleams of freshly-cut marble. Marble fronts and marble statuary are out of place in city streets frequented by pigeons and sparrows, or where soot and dust must be deposited upon their horizontal surfaces or in their carved recesses, and the present condition of the arch in Madison Square is not any worse, so far as stain and discoloration go, than would be the condition of an arch built of marble at about the same time.

SPEAKING of sculpture it is well to record that the Art Students' League of New York, one of the vital organizations for artistic instruction in this country, is moving to make the instruction it gives in sculpture of more immediate and practical value to the student, and to this end is to receive the more active co-operation of the members of the National Sculpture Society. The particular direction in which movement is to be made is in directing the training more toward the field of architectural and industrial modelling, a field which is now mainly tilled by German and Italian artisans. If, as seems likely, we are to have a succession of world's fairs in different parts of the country, each housed in temporary structures covered with stoffe and lavishly decorated with sculpture and plastic architectural decorations, it is very desirable, for the sake of advancing the popular appreciation of the fine-arts, that this

ornamentation, short-lived though it is to be, should be of as high a grade of artistic excellence as possible. In carrying out the work the pupils trained in the classes of the Art Students' League will find not only opportunity for the employment of their skilled hands and cultivated intelligences, but the best of all possible means of acquiring that personal fame that will lead to the placing in their hands of private commissions for individual work of a higher grade. If, however, the movement should result in encouraging the miscellaneous and exuberant application of plastic decoration to street architecture that obtains in Vienna and Berlin, the new movement will be very unfortunate. It is here, however, that should intervene the restraining influence of the instructors, who we hope will impress on their pupils early and late that, in design, a wall surface has other functions to perform than affording a base for plastic decoration.

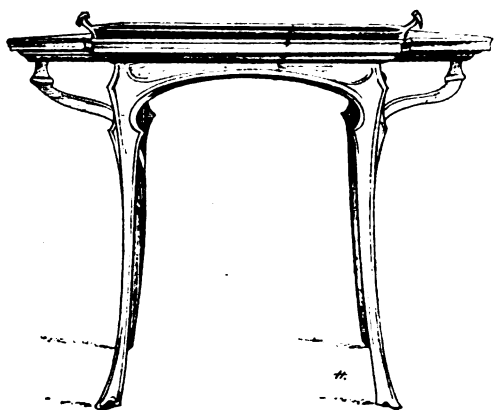
EVEN when the passion for world's fairs, with their demands for sculptural decorations, has passed away, those sculptors who, like Potter, Proctor and Kemeys, make a specialty of modelling wild or domesticated animals need not feel that their usefulness has passed from them, for they will by that time find they can earn an honest penny by catering to the whims of the former owners of valued horses, pet dogs and cats. There are already not a few very worthy effigies of noted sires and winners in different parts of the world, whether as symbols of affectionate remembrance or exultant pride, and sculptors of the first rank have taken pleasure in executing such commissions. Whether or no the advent of the automobile will increase or diminish the demand for equine sculpture, it is plain that the day of the dog, long prophesied, has come at length, and the *animaliers* of to-day and to-morrow may find employment for their fingers and modelling-tools in preparing portrait and idealized memorials to place above the graves of the lamented canines who are to sleep for the stipulated term in the dogs' burying-ground on the Ile des Ravageurs, in the Seine, near Clichy. This burying-ground, established because of a law of June, 1898, is approached through a rather elaborate, but not particularly symbolic, stone gateway of three openings, and already contains a large number of graves marked by headstones, decorated with portraits of the departed in relief or in the round. Although the latest, this is not the only dogs' cemetery, for, without considering the thousands of private nooks where honored and faithful service is recorded, there is a similar burying-ground in Hyde Park, London, while Queen Victoria has established one at Windsor, and the Queen of the Belgians maintains one in the Laeken Palace grounds near Brussels. Moreover, the more public grounds at Sceaux have long been noted. In this country, too, a movement under the direction of Dr. H. H. Kane, of New York, is on foot to establish a similar depository in connection with a home-farm where aged horses and dogs may pass the last months of life in quiet comfort. It is a worthy undertaking and, as we say, may afford American *animaliers* a means of keeping their kettles aboil.

THE cable brings news from Athens that a "magnificent marble statue of Apollo, life-size," has been discovered in that vicinity, that it is "believed to be the first in existence," and that its workmanship shows it to date from the fifth century B. C. This announcement which reminds one of the manner in which the finding of the Cardiff giant was heralded a score of years ago is very likely the recording of a veritable fact, and archaeologists, if not artists, will take interest in the event, just as physiologists and men of science will take interest in the finding last week in Idaho of a petrified human body — and perhaps one event is of as much value to the world as the other. Beyond the fact that the statue is seemingly an entire one, there is no very good reason to suspect that the find is not a genuine one; but the ingenuity of the purveyor of archaeological material being so great, and there being seemingly no limit to the patient trouble he is willing to take for the sake of disposing of some faked-up *trouvaille*, at a fabulous price, it is well to accept all such reports with a certain reserve. Cypriote and Italian peasants and Egyptian fellaheen have more than once shown themselves to be particularly successful in finding things that they had themselves concealed a few years before, then freshly made. The archaeological world, curators of public museums and the really instructed amongst private collectors are so thoroughly familiar with the wiles of the fabricator of antiquities that, nowadays, nothing is accepted as genuine until after the most patient examination of more than one expert, so

there is little real risk that this new Apollo will find a place in the great museum of Athens if it really ought not to be there.

WHILE the fabricator of antiquities will take infinite pains, there is one kind of swindle he cannot venture on, so when an exploring expedition uncovers the foundations of an ancient city lying beneath the less ancient remains of a younger ancient city it may be safely accepted as a fact that the explorer this time has got ahead of the fakir and that the finds brought to the surface are genuine; and though it is still possible to question the authenticity of the minor articles discovered by Schliemann, there is no gainsaying the archaeological value of his great discoveries in the Troad. In the same way the discoveries made by Professor Hilprecht, director of the excavations now making by the expedition of the University of Pennsylvania, at Nippur, in Babylonia, are beyond suspicion and quite beyond present valuation. Discoveries that carry back the recorded history of civilization thousands of years beyond the limit hitherto assigned, not to the history of man, but to the history of the world itself, as recorded by the Bible historians, are discoveries of the first importance surely. Professor Hilprecht this year has uncovered a part of the library that belonged to the great Temple of Bel, and in it he has found, on clay shelves arranged around the rooms, many clay tablets inscribed in cuneiform characters, over seventeen thousand of which have been taken out in the last three months, while a hundred and fifty thousand more are still believed to be recoverable by later excavations. These tablets are found to be not, as has been the case with earlier tablets found here and elsewhere, merely commercial and municipal records, but treatises dealing with philology, grammar, lexicography, mathematics, and so on, the kind of literary matter, that is, that one would expect to find in the great library of a great and civilized people. Hasty examination shows that none of these records relate to transactions later than the year 2280 B. C., a date which corresponds with the invasion of the Elamites and tends to prove that the library and city were destroyed during that invasion. To what date the historical records will carry the world's history when they come to be discovered and translated, it is not possible to guess, but it is fairly plain that historians and geologists will find themselves more nearly approaching an agreement than ever before. Taking the evidence of the ruins themselves, inscriptions on them show that some of them date from the time of Sargon I, who ruled thirty-eight hundred years before Christ and seventeen hundred years before the days of Abraham, while various indications lead Professor Hilprecht to believe that this Temple of Bel dates earlier than 6000 B. C.

IT is an open question whether next week will find the labor situation in Chicago in a better or worse condition than ever. As Labor Day approaches both the contractors and the unions appear to be preparing for a final effort each to gain their own ends, and thus at length be able to resume continuous operations upon some settled and agreed basis. The union leaders seem inclined to make a final stand and are considering the possibility of ordering a complete strike in all branches of trade, a move of very doubtful efficacy considering the defections from the Building Trades Council that have already been announced, while the contractors declare that after Labor Day they shall consider Chicago an open market for labor, unless the unions will abandon permanently the "sympathetic strike" as one of their weapons of offence. The developments of the labor question are always interesting to watch and study, but nowhere has a more curious and more dangerous phase developed than in Vancouver, B. C., where the local unions have absolutely prohibited their members from joining, or remaining in, the militia. In doing this the unions have taken a step which brings them perilously near to giving notice that they enroll themselves in the ranks of anarchists, pure and simple, enemies of society as established, and as such to be pursued and punished to the bitterest extremity upon the performance of the first overt act against the laws of order. The militia is one of the recognized arms of government and any citizen who evades duty in its ranks is unworthy of the protection which under other circumstances the law would afford him, and for all we can see is subject to attainder for treason the first time he resists the law. Any body of men who give public notice that they feel themselves obliged to obey rules that contravene the laws established, by and under the constitution, by the people, place themselves voluntarily in the position of public enemies and must abide the consequences.

RAPHAEL, MICHAEL ANGELO AND LEONARDO.¹—II.

A Tea-table designed by Henri Sauvage.

OF all the great masters of the Italian Renaissance, Raphael was without contradiction the most apt in expressing, with as much intensity as spontaneity, the religious sentiment, and the most successful in disengaging himself from Classic suggestions. His father, a poet and painter of some worth, owes the mediocrity of his reputation to the brilliancy of his son's glory. The qualities and tendencies which Raphael inherited underwent, furthermore, the soft influences of Umbria, where art used especially to be distinguished for its grace and suavity. His temperament was fed and ripened amid surroundings saturated with mysticism. In the studio of Perugino, who was his first master, he lived amidst angels and madonnas, and his soul was constantly haunted by the attitudes of the Virgins, by the legends of saints, by subjects which hardly departed from the obligatory formulas of devotion. But in order to comprehend how superficial must have been the ascendancy that these purely local accidents exercised over a nature so vivacious and fruitful, borne perforce to enlarge the limits of his activity and his conceptions, one must stop an instant before the artistic life of that time, so as to comprehend the ideas and theories of the resurrection of the humanities and the cultivation of Hellenism which had spread throughout all Italy. Do we not know, for example, that Perugino, who passed his time in encircling the heads of his martyrs with luminous halos, who employed the agility of his brushes entirely in lighting up the countenances of Virgins, who applied himself in his works with marvellous mastery to rendering spiritual conceptions, did not believe in the immortality of the soul? We do not have documents which permit us to weigh the degree of religious fervor with which the soul of Raphael was penetrated, but it is very likely that the conversations, perhaps the jesting chit-chat of his master, must have wrecked the piety and devotion with which his soul was filled on the day when he quitted his father's roof. It is probable that at the time he left Umbria his spirit was, if not sceptical, at least troubled, uncertain, prepared in consequence to face without fright and repugnance the affiliation which must fatally unite the work of the Renaissance with the beauties of paganism, and that his understanding was sufficiently free from all superstition to enter in contact with the resurgent spirit of pagan civilization, without fear of committing sacrilege.

So, from the time when he left Umbria, where his genius was nourished like a flower shut up in the greenhouse, and arrived in Tuscany, where he found himself face to face with the exhumed relics of pagan art and with the works which were already animated by the breath of an abounding Hellenism, we see him grow in stature, perfect and transform himself, just as a plant rudely transplanted into the open air; and one can from that time, by following step by step, note the diversity of the impressions which he received and the influences to which he yielded. The works of Fra Bartolomeo unveil to him the variety and abundance of resources of the palette and impress him by amplitude of style and composition; he will borrow from them richness of coloring, but he will not imitate them except in certain easel paintings. The nudes of Masaccio impress him deeply, make him feel the poverty of bodies too straitly draped, reveal to him the symphony of the muscular system, the harmony of flesh animated by the concealed movement of nerves and the circulation of life, the eloquence, imposing and sound, of the human body expanding in the plenitude of its force and action. The study of the cartoons of Michael Angelo and Leonardo da Vinci fills him with astonishment; for the first time he finds himself in the presence of two magistral works, in which two incomparable masters, of opposing temperaments, have given the measure of the prodigies which grand art can accomplish. He is impressed by the range of means which these two powerful rivals have known how to use in demonstrating that art is not necessarily limited to the interpretation of religious ecstasies, that, on the contrary, it can reach the highest summit in translating the meanest action of life. Contact with Pinturicchio, whose works were distinguished particularly by their freshness, their originality and a certain perfume of worldliness, finally wins him from the religiosity which he had contracted during his collaboration with Perugino, and the sight of the "Three Graces" at Sienna cause him

to enter into communion with Pagan sentiment. We have already spoken of the living influence exercised over him by this meeting and of the persistent complaisance with which he returned again and again to this subject, the vision of which never left him. Just in proportion as he hastens over these stages, his genius progresses towards full maturity; he gathers material from stage to stage of his travel for the sake of recreating himself, and it is after having passed through these different transformations that Raphael reaches Rome. We can see that he finished his apprenticeship only on the day when for the first time he entered the eternal city, where he was to raise monuments which have assured to his name and to Italy an imperishable glory.

Raphael's work is wholly at Rome. *En route*, he produced during the pilgrimage which brought him to the Catholic metropolis certain pages of high value, in which we have seen, turn and turn about, born and grow his mastery and his budding genius sending out its rays; but the real monumental pages of his work, those in which he condenses the highest thoughts of an artist, are at Rome, in the Vatican, in Santa Maria della Pace, and in the Farnese palace. Examining his works from near at hand, we perceive, it is true, that Sanzio no more than Michael Angelo escaped from that secret law which sometimes forces an artist, who has not voluntarily indulged in plagiarism, to allow to be perceived in his creations certain reminiscences of the *chefs d'œuvre* of which he has felt the fascination. The "Sibyls" of Santa Maria della Pace, and even the "Isaiah" of S. Agostino, are figures which seem to have issued from the Sistine Chapel and of which Michael Angelo might on more than one ground have claimed the paternity; and even in the "Adam and Eve" of the Loggia there are things which smack strongly of the long halts which the painter of Urbino made in the Masaccio's chapel at Florence. But that which is most interesting to remark is the easy grace with which the master of Urbino mingles the characters of pagan fable with the most august features of biblical lore and Christian legend. One notices sometimes in his interpretation of figures belonging to these two classes an equal disdain for consecrated formula; for example, in the "Apollo Musagetes" of the Camera della Segnatura, who holds a violin in his hand in place of the Classic lyre. Let us also note that he created an ornamental style for himself by taking as models the stuccos and paintings which decorated the Baths of Titus.

Finally, it is well to remark that, at the very time when the genius of the great Italian painters was spreading so bright a glow over the Renaissance, painting was still considered in Italy only an inferior art, a secondary means of embellishment, to such a degree that the *chefs d'œuvre* of the brush were enclosed in caissons, relegated to ceilings, as so many mere motives of decoration on which the inattentive visitor might at times cast a passing glance.

But let us return to the pagan conquest which is insensibly working under the influence of triumphant Hellenism. Let us consider the Farnese. Raphael living in the reign of Augustus could not have painted otherwise and Lucullus would have found himself as much at his ease here as the Epicurean prelates in the time of Leo X, while a fervent and pious monk, an ascetic of the fifteenth century, would feel himself *dépaycé*. Consider the "Triumph of Galatea." What could be more profane and voluptuous than this image of a nymph standing on a sea-shell and drawn by two dolphins? what more sensual than the gambols of the Tritons and nymphs, than this smooth and velvety abundance of flesh, resplendent over the spuming waves, in a magnificence of warm, intoxicating light? It is here, in this splendid palace of the Renaissance, that one can take account of the irresistible ascendancy that the charm of pagan beauty, the mythological symbol, exercised upon the genius of Raphael. One sees the sovereign force of Jupiter blooming side by side with the subtle and shrewd malice of Mercury, the voluptuous grace of Venus side by side with the licentious coquetry of Psyche; we see the seductive group of the "Three Graces" displaying their charms in the midst of innumerable figures of the Hellenic fable: Pluto, Hercules, Pan, Cupids; and this resurrection of Hellenism worked by the brush of a great Christian painter is so catching that before this striking spectacle Taine cries: "Between 'The Descent from the Cross' and the Farnese, the birth of Pagan Renaissance passed over his head and developed his entire genius on the side of joy and vigor." And this return towards paganism is so imperative and violent that it does not affirm itself only in works which, like those in the Farnese, have only a profane destination. It manifests itself everywhere and always, even in the monuments which have a religious character. In the "Stanze," the mystic dispute of "The Holy Sacrament" has for a pendant "The School of Athens," the masters of Greek philosophy, disputing over doctrines which the Catholic faith has repudiated and condemned, are placed in the same plane as the Fathers of the Church disputing over the miracles!

For the rest, it is enough to run over Raphael's *répertoire* to see that pagan inspiration has had the upper hand in his work. At every moment one sees recurring the names and symbols most celebrated in Greek and Latin worlds: here it is a portrait of Virgil, or "Apollo and Marsyas," there are the "Three Graces" or the "Death of Meleager," a little farther on, the "School of Athens" or the "Muse Calliope," or "Melpomene," or the whole "Parnassus"; and then, "Apollo and Marsyas," and then the "Sibyls" of Santa Maria del Popolo, the "Triumph of Galatea" at the Farnese, the "Phrygian Sibyl" at Oxford, the "Jupiter and Cupid" at the Louvre, "Cupids showing Psyche to the Graces," "Venus, Juno and Ceres," "Venus

¹Continued from No. 1287, page 61.

and Jupiter," the "Car of Venus," "Mercury and Psyche ascending to Heaven," "Mercury in search of Psyche," the "Marriage of Psyche and Cupid," "Psyche received into Olympia," "Cupid Victor over Mars," a "Ring of Loves," the "Abduction of Helen," the "Judgment of Paris," the "Marriage of Alexander and Roxana," "Neptune calming the Tempest." This is more than a reminiscence, this is a veritable resurrection that takes place, as we said before, by means of the brush of the greatest painter of Christianity. The symbols of pagan mythology, the gods of Olympia, all the fictions and all the dreams of the pre-Christian world have come to life again and have come to people Catholic temples, to be enthroned in the very monuments erected for the glory of the new faith. The victory is complete, for it is exactly this mixture of grace and beauty, this blossoming of force and healthy gaiety which corrects what there was of sombreness and discouragement in Christian art; the gayeties of Olympus cause us to forget the pains of the Passion.

At the side of the artists of his time, whose genius hovered between the religious feeling of their century and the seductiveness of Hellenism which, down from the ages, had finished by finding in the flowering civilization of the Renaissance surroundings favorable to its re-birth, Leonardo da Vinci worked and thought like an artist belonging to another epoch, to an epoch of which the dawn had hardly yet come. He was neither Christian nor pagan, he was human. Raphael and Michael Angelo were two colossi whose work is, as it were, the prolongment of paganism into Italian civilization: Da Vinci is the precursor of a civilization which is not yet born. Michael Angelo and Raphael have been the last of the Classics; Da Vinci is the first of the modern painters. He knows everything that his contemporaries can know. His spirit soars above the relatively narrow professionalism of his rivals. He is what a thorough artist should be who is wise, philosophical and a thinker. Read his letters to the Duke of Milan, Ludovic Sforza. He knows perfectly well that this head of a state who dreams of deposing his nephew, and who is surrounded with enemies who, in their turn, dream of de-throning him, has nothing to do with a dauber of canvas, a kneader of clay, and so he first offers to build him movable bridges for the passage of his troops, to dry up the moat of a fortress, to provide him with a means of demolishing besieged fortifications, to furnish him with mortars capable of hurling hurricanes of projectiles of which the mere smoke shall cause terror and confusion amongst the enemy, to dig mines and masked vaults, so as to penetrate besieged cities without warning, to construct chariots armed with artillery which, under the shelter of an attack, can in safety be advanced in the midst of an army, protecting the march of the infantry which follows them; in a word, he offers to create engines of the most murderous description, to provide all the resources of mechanics applicable to the necessities of war, and at need to adapt these engines and these resources to naval warfare. And then there is, last, a matter of an accessory employment: he declares that in times of peace he knows how to carry on works of irrigation, how to erect buildings, execute sculpture in marble and bronze, and paint; all these he does, without having the air of boasting about the matter, quite as well as anybody else.

A century before Bacon, who was born only in 1561, he discovers the formula of the doctrine of experiment which has become the very foundation of modern science, and he clearly establishes that this doctrine must be applied to creations of art. "I am going to treat such a subject," he says, "but before all I must make certain experiments, because my design is to, in the first place, cite experience, and next to demonstrate why bodies are compelled to act in such and such a manner: this is the method which one should observe in investigating the phenomena of nature." When he speaks of nature, he does not merely understand nature in its active form, but also, and especially, nature in its thoughtful form, of which the first is only the result and the reflection. In the human machine he does not merely see the play of muscles which agitate and move it, he also divines the interior source, the occult force, which determines it and regulates its movements. Raphael used to say that he had to paint nature not as it was but as it ought to be, but those who have seen "The Conflagration of Borgo," and who have recognized in the "Madonna of the Seggiola" the features of the buxom matron of the Trastevere, knows that he means to speak of plastic nature. Michael Angelo, also, used in the decline of life to study the beauties of nature, whose exuberances and violences he so vigorously interpreted. But Raphael only tasked himself to embellish the graces of form, while Michael Angelo excels in translating and increasing the amplitude and dramatic power of gesture. Da Vinci saw behind the form the spirit which animates it, and behind the gesture he saw the will which directs it. For him, the human body is an urn through which shines the light of the soul. He does not confine himself to tracing profile, to measuring the relations of shadows which heighten the effect of the contours: he looks between and discovers the rays of the heart of life which light it up from within. In a word, he is a painter of the soul.

One can say, even, that at a given moment Raphael was impressed by the painting of Da Vinci, and by the interpretation of the spiritual life which exhaled from it; he felt the impression vividly, and we find traces of it particularly in his portrait of Maddalena Strozzi, which is in the Pitti Palace, in the "Virgin with the Palms" at Bridgewater, and in the portrait of "Agnolo Doni." It would also be easy to prove that the competition for the "Battle of Anghiari" did not leave Michael Angelo indifferent. In revenge, it does not seem that Raphael and Michael Angelo made a sensible impression

on Leonardo, and this can be understood; he had nothing to learn from them, for, if he was superior to them because of searching after and knowing how to seize the secret springs which animate the human figure and make it reflect the sentiments and passions, he possessed quite as much power of technique and did not yield to them in magistral knowledge of the laws and principles of art.

The Florentine episode, the one relating to the decoration of the Sala del Consiglio, was one of the most singular of his life; we are not thoroughly sure that there really was, as is commonly believed, a competition between Leonardo and Michael Angelo. Vasari does not speak of the event in a manner to make us believe that there was a competition. However that may be, Leonardo was the only painter capable at that time of measuring himself against Michael Angelo. We know that the latter's cartoons made a vivid impression on Da Vinci; but it is beyond doubt that the work of Leonardo produced on the imagination of his rival a most profound effect, the evidence of which can be traced in some of his work turned out at a date later than this alleged competition.

Here it is proper to remark that Da Vinci has the incomparable privilege of being a great painter whose master-works have disappeared and whose reputation has survived the masterpieces which were the source of his glory. The famous cartoons which were intended for the decoration of the Sala del Consiglio and which excited so lively an admiration in his contemporaries disappeared almost immediately, and there remains of these precious documents only reproductions whose fidelity to the originals is properly subject to doubt. Nevertheless, these reproductions sufficiently demonstrate that the admiring wonder called out by this great artist was not exaggerated. "The Last Supper" in the Convent of Santa Maria della Grazie, at Milan, which was in reality the *chef d'œuvre* of Da Vinci, has undergone disastrous vicissitudes and ended by disappearing; we know it only by certain copies, more or less reliable, and by descriptions which can give us only an approximate idea of it. The only masterpiece of Da Vinci's which escaped a fatality which seemed to condemn all his creations to effacement is the "Joconda" in the Louvre, but the portrait of Mona Lisa is enough to give us the measure of the irreparable gap which the disappearance of "The Last Supper" and the cartoons have left in the artistic patrimony of humanity. This portrait, on which Leonardo worked for four years, is the work of a forerunner. On reading the description which Vasari gives of it, one divines that the genius of the grand painters of that time was not sufficiently formed, sufficiently enlightened, sufficiently deep, to comprehend and appreciate the essentially human and intellectual character of this work. Vasari undertakes to make plain the merits of the drawing, the technical perfections, the painstaking care with which the details of execution are rendered, the *finesse* with which the growth of the eyelashes is marked, the precision of the tones and the prodigy, thanks to which one almost sees the beatings of the artery in the throat. He has not seen, though, the effort by which the painter succeeded in making visible in this portrait the feelings of the soul and the reflections of the life within, of the spiritual nature; he has not suspected that the portrait of Mona Lisa was the first manifestation of a new art, and that this portrait had no relationship with the productions of contemporary art, purely representative and plastic.

We find, in short, amongst the works of Raphael and Michael Angelo figures which express with intensity, clear and delicate, feelings of force, sweetness, sorrow, ecstasy, faith. But these expressions are generally the fruit of chance. We meet every day in the Roman Campagna, in the Trastevere, there where Michael Angelo and Raphael used to hunt up their models, women of the people whose countenances express these same sentiments. They have the physiognomy of a soul which does not yet exist in them; bodies prepared to experience certain sensations, but in which these same sensations are produced only when their primitive nature shall be perfected and after intellectuality, of which they have the exterior forms, shall have at length animated them. In exactly copying these faces, one can produce the illusion of a sentiment of which only the envelope exists as yet, and the summary indication of it in their faces. But the "Joconda" is a work in which the lights of spiritual life, the radiance of the soul, are the effect of a premeditated effort, a voluntary search; and this work is the first in which this search and this effort have been attempted.

Here is nothing of the glorification of force, of the grace of form, the seductiveness of beauty, which have been the characteristics of pagan art; nothing of that religiosity, sometimes caressing and sometimes terrible; nothing of those transports and terrors which form the essence of Christian art: we are here in the presence of a work really and profoundly human; we see and appreciate the distance which separates Classic art, of which Raphael and Michael Angelo were the last and most eloquent interpreters, and modern art, of which Da Vinci has been the prophet and the precursor.

H. MEREU.

METHOD OF RENEWING AIR. — Two French chemists, MM. Desgrez and Balthazard, according to a Paris dispatch, have made a discovery which enables them to renew air indefinitely. Bioxide of sodium in process of decomposition gives off oxygen, and at the same time absorbs carbonic-acid gas, thus providing pure breathing air and removing the air that is vitiated. The chemists constructed a sort of diver's helmet of aluminium, which, with a lining of bioxide of sodium, permits persons to move and work for hours in otherwise unbreathable surroundings. — N. Y. Evening Post.

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BON VOYAGE.

ON Saturday, August 4, Mr. Louis Allen Osborne, Principal of the School of Design, Scranton, Pa., started for Europe, where he will make a study of the systems of instruction in the principal art-schools of England and France. Mr. Osborne has already visited many of the principal schools and colleges teaching ornamental design in the Eastern part of the United States, in order that our Course in that branch of study might embody the best material and be conducted upon the latest and most approved system. In addition to this, his experience gained by a thorough study of the Kensington Art School in London, and the School of Fine Arts in Paris, will enable him to conduct the School of Design upon a system far in advance of what was originally intended for it. By visiting in person the monuments and objects of art that are used to photographically illustrate the Instruction Papers, he will be able to lay before our students a concise and logical explanation of the theory of ornament that can be exceeded in value only by a personal visit to these monuments by the students themselves. He will also visit the leading manufacturing districts of England and France, studying the theory of applied design as put into practical demonstration by the designers employed in large plants, such as those of Manchester, Sheffield, Nottingham, Birmingham, etc., in England, as well as those of Lille, Valenciennes and Rheims in France, and Brussels in Belgium.

INTL. CORRESPONDENCE SCHOOLS,
SCRANTON, PA.

PENCIL VS. PEN AND INK-POT.

ONE day just after the editor of a great daily paper had mislaid his Dixon "American Graphite," and been obliged to use a pen again, he sat down and wrote as follows:

"The form of the stylus or steel-pen changes, and the pigment and its vehicle vary, but this otherwise enlightened and lucky generation is as much the slave and the victim of the ink-pot with its nasty contents as was the mediæval monk, the Roman, or the Greek, or the Egyptian under the first dynasty, or the Chinamen of the time of Lien-Hwang, the Celestial.

"How many million lifetime units of muscular and nervous energy have been expended unnecessarily in the mere act of stretching the hand over to the ink-stand to dip the pen in this black liquid, relic of primeval barbarism? How many precious souls

have been sent to perdition in consequence of the emotional upheaval over the besmeared fingers, the blot on the fair page or parchment, the ink-bottle upset by the office cat! No wonder Martin Luther hurled his ink-pot at the devil; that utensil fairly belongs to sheol.

"Away with pen and ink-pot, and even the fountain pen! My kingdom for a lead pencil!"

MODELLING THE DESIGNS.

PERHAPS you have wondered why Berger's Classic Metal Ceilings are so different in appearance from the ordinary stamped-metal plates of other makers.

The general run of metal-ceiling plates are stamped from die-sunk models; hence, produce more or less of a stiff mechanical effect.

Berger's Designs, on the contrary, are first modelled in clay, by the deft fingers of an expert, who gives them the artistic finish possible in this plastic material.

The model is faithfully reproduced in the die, and our correct method of stamping brings out the detail in bold relief.

Thus we retain the characteristic plastic effect of the original model, and secure an artistic elegance that would otherwise be unattainable.

This is only one of the features that are making Berger's Classic Metal Ceilings famous.

Write for Catalogue No. 5 and full particulars.

THE BERGER MFG. CO.,
CANTON, O.

TWO IMPORTANT CONTRACTS.

MORSE, WILLIAMS & Co., Philadelphia, Pa., one of our largest manufacturers of Elevators report two particularly large contracts for the month of August—one from the Union Passenger Station at Pittsburgh, consisting of five Hydraulic Passenger Elevators; two Hydraulic Passenger and Freight Elevators; six Hydraulic Freight Elevators of the Plunger type, all made with the latest improvements and best approved designs. Another large contract from the Terminal Station, Chesapeake & Ohio Railroad, for two Hydraulic Passenger and two Hydraulic Freight Elevators.

The Morse, Williams Company are among our most progressive manufacturers, and are well equipped for furnishing Elevators suited to every purpose. They are thoroughly informed as to every improvement in their special line of manufacture, and give perfect satisfaction to their many patrons.

VERMONT MARBLE WINS.

A CABLEGRAM just received from Paris announces that the Columbian Marble Quarrying Company, of Rutland, has been awarded the gold medal for the finest exhibit of marbles at the Paris Exposition. This news is a great honor to the Company and the State. Vermonters will join with the Company in welcoming this trophy, and the citizens of Rutland will be especially proud to learn that marble taken out of the local quarries has been given first place in competition with the varieties produced by Italy and other marble-producing countries of the world. The Columbian Company's quarries produce white, blue and fancy marbles, numbering sixteen varieties, which places the Company well up to the head in the matter of the grades of marble put on the market.

The exhibit of the Company was placed in the floor and wainscoting of the United States Exhibit Building at Paris. The floor was laid in large blocks of white marble, with smaller pieces of colored marble forming a border. The wainscoting displayed to advantage the more richly-colored varieties.

This award will bring to public notice the beautiful varieties of marble produced in America and especially in Vermont. The Supervising Architect's Office of the United States Treasury has recognized that this State produces all the colors of marble required in any color-scheme, and that they can produce more beautiful effects from these than from any foreign productions. The marble produced by the Columbian mill is now being used for the embellishment of many post-offices, custom-houses and United States court-houses throughout the United States.

NOTES.

In one after another of the Besse Syndicate of New England stores the Frink System of show-window and store lighting has been installed. As this work has extended over a period of two years, the proprietors have had ample time to test the efficiency and economy of the system, and it is a noteworthy fact when once a mercantile concern has used this system it never goes back to another, either when building new stores or remodelling old ones. Among other recent important contracts reported by I. P. Frink are thirty of the Woolworth Five and Ten Cent Stores in different parts of the country, in which the window-reflectors are being installed. Rogers, Peet & Company, whose old store at the corner of Warren Street and Broadway was

(Continued on page 3.)

VI

NOW READY

VI

“The Georgian Period”

..PART VI..

PART VI of “The Georgian Period,” which is published to-day, we believe will be found the most valuable and interesting portion of this work thus far published.

In the main its contents will be found to relate to

The Colonial Work of Virginia

and though much has escaped notice, of course, it deals efficiently with

“Baltimore House”—The Home of the Calverts

“Woodlawn”—The Home of Nellie Custis

“Mount Vernon”—The Home of George Washington

besides such well-known river mansions as “Carter’s Grove,” “Shirley,” “Lower Brandon” and “Westover,” and such less-celebrated places as “Stratford House,” “Elsing Green,” “Tuckahoe,” “Gunston Hall,” and the homes of the Washington brothers, “Harewood,” “Claymont Court,” etc.

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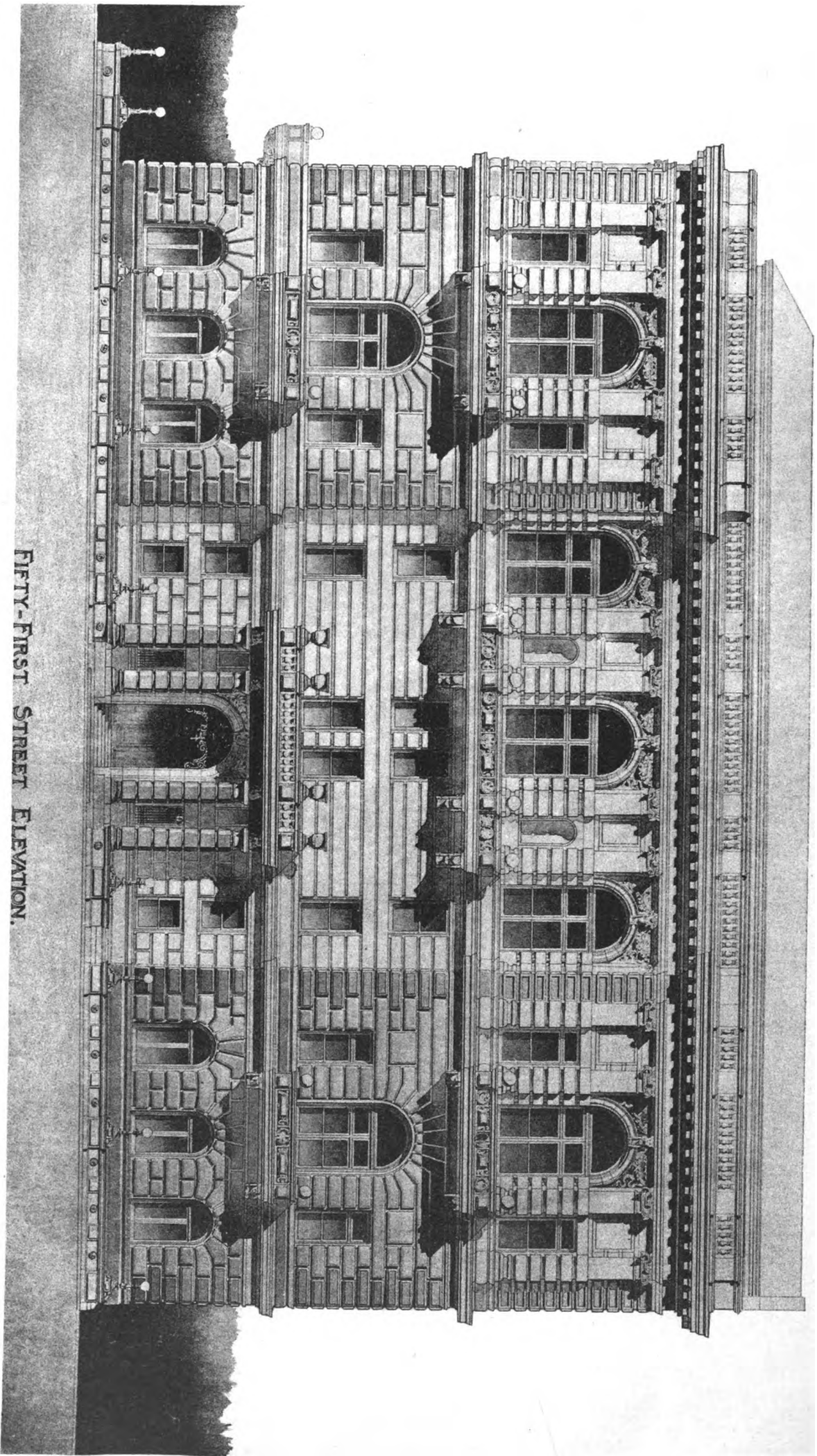
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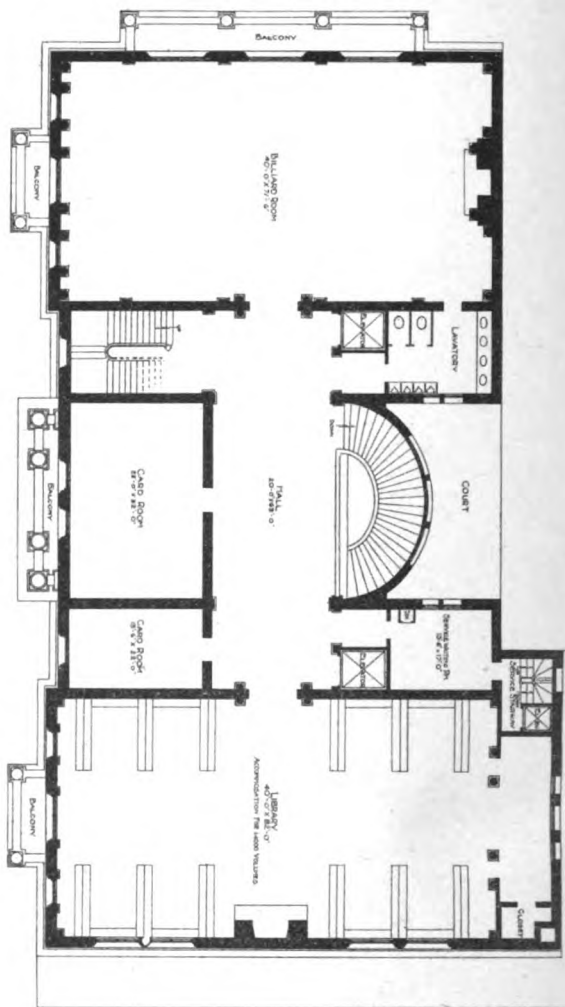


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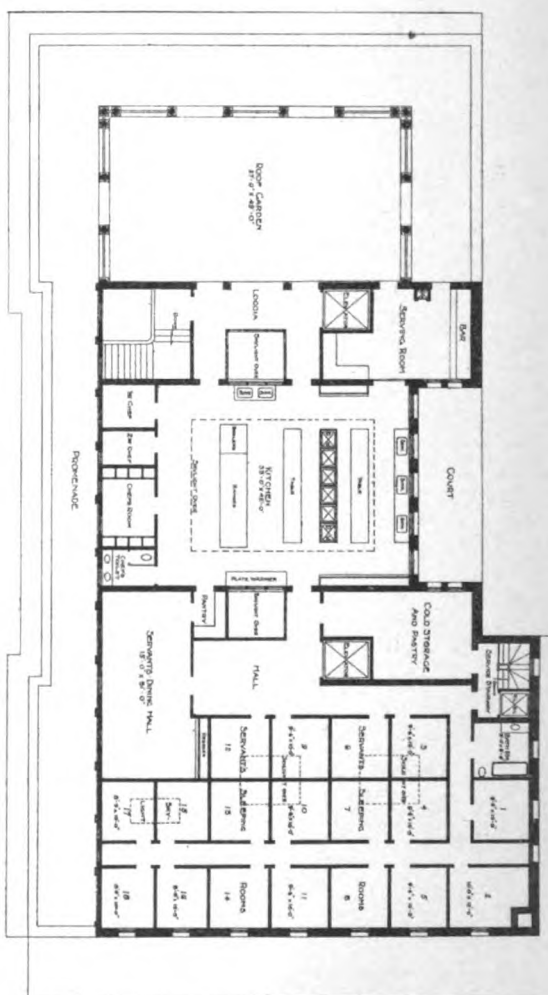
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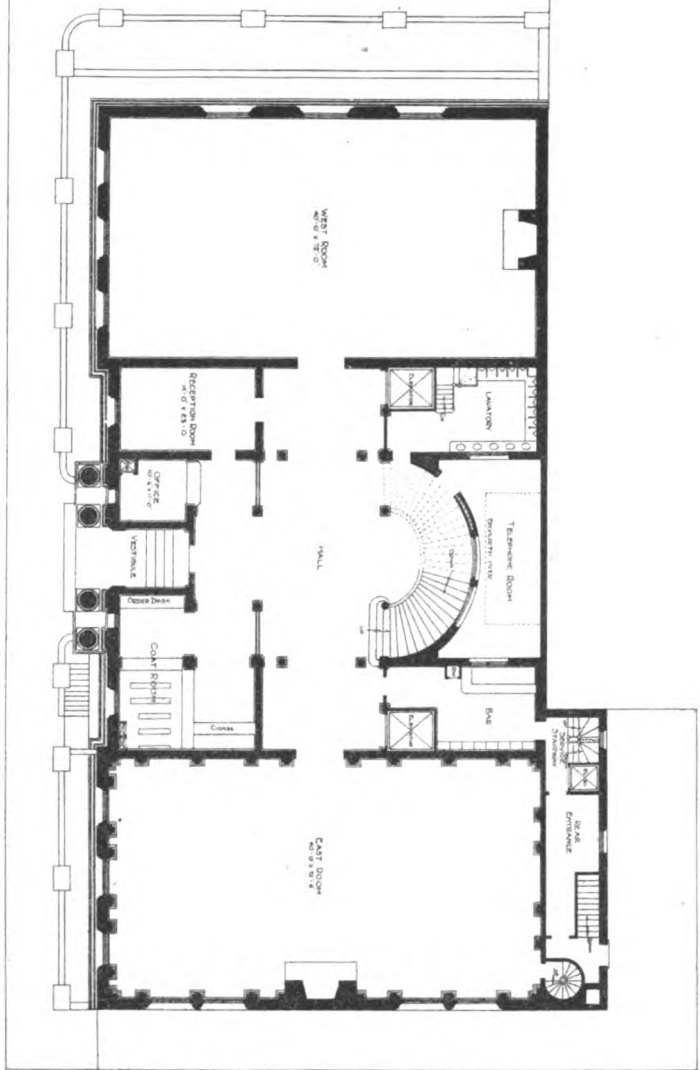
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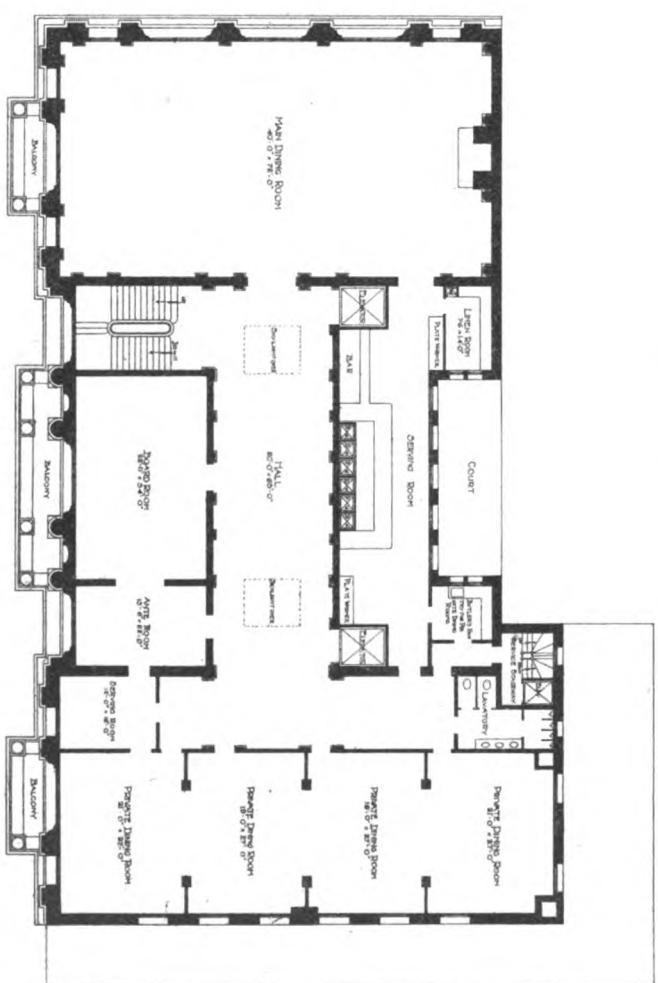
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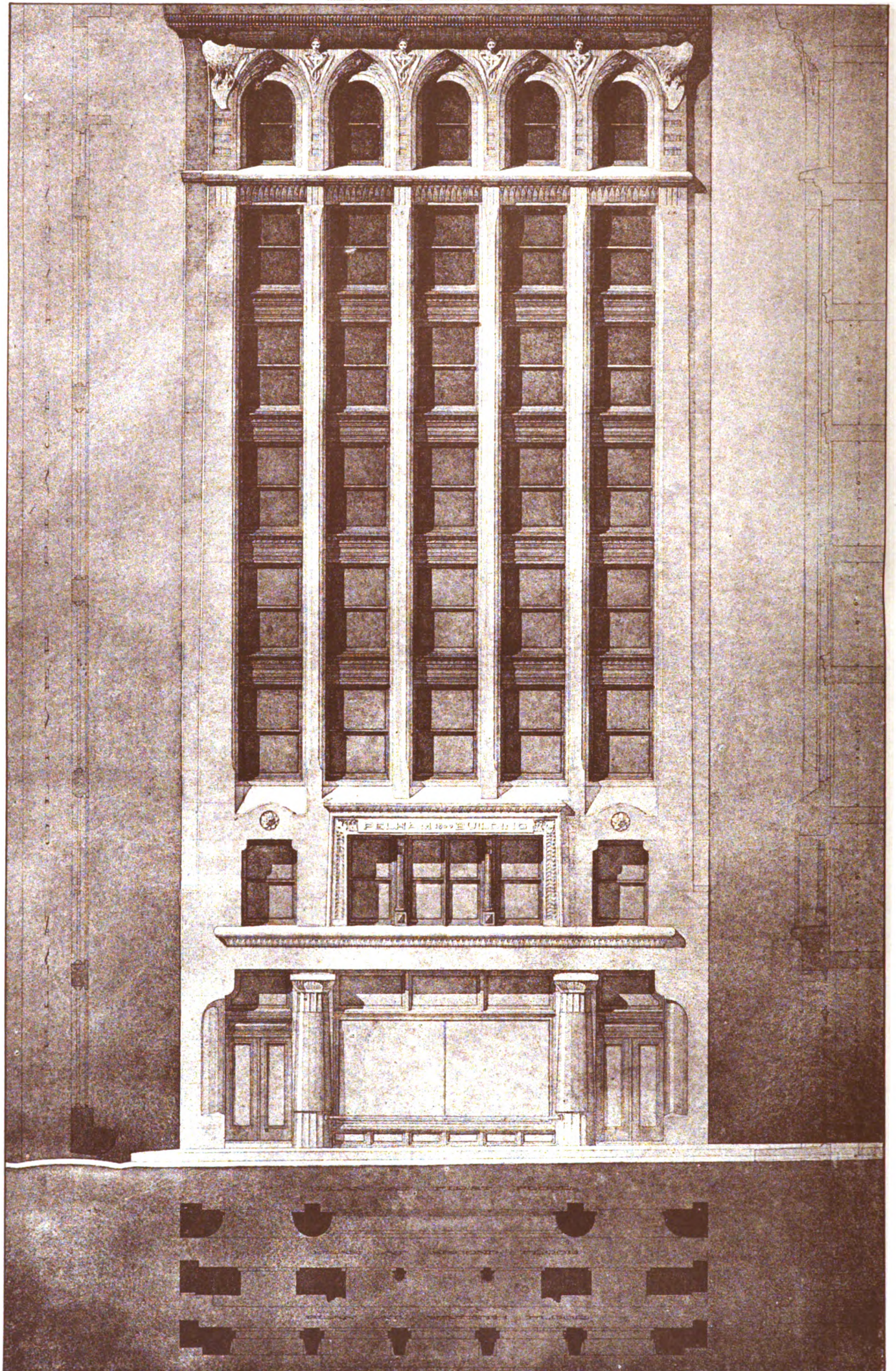


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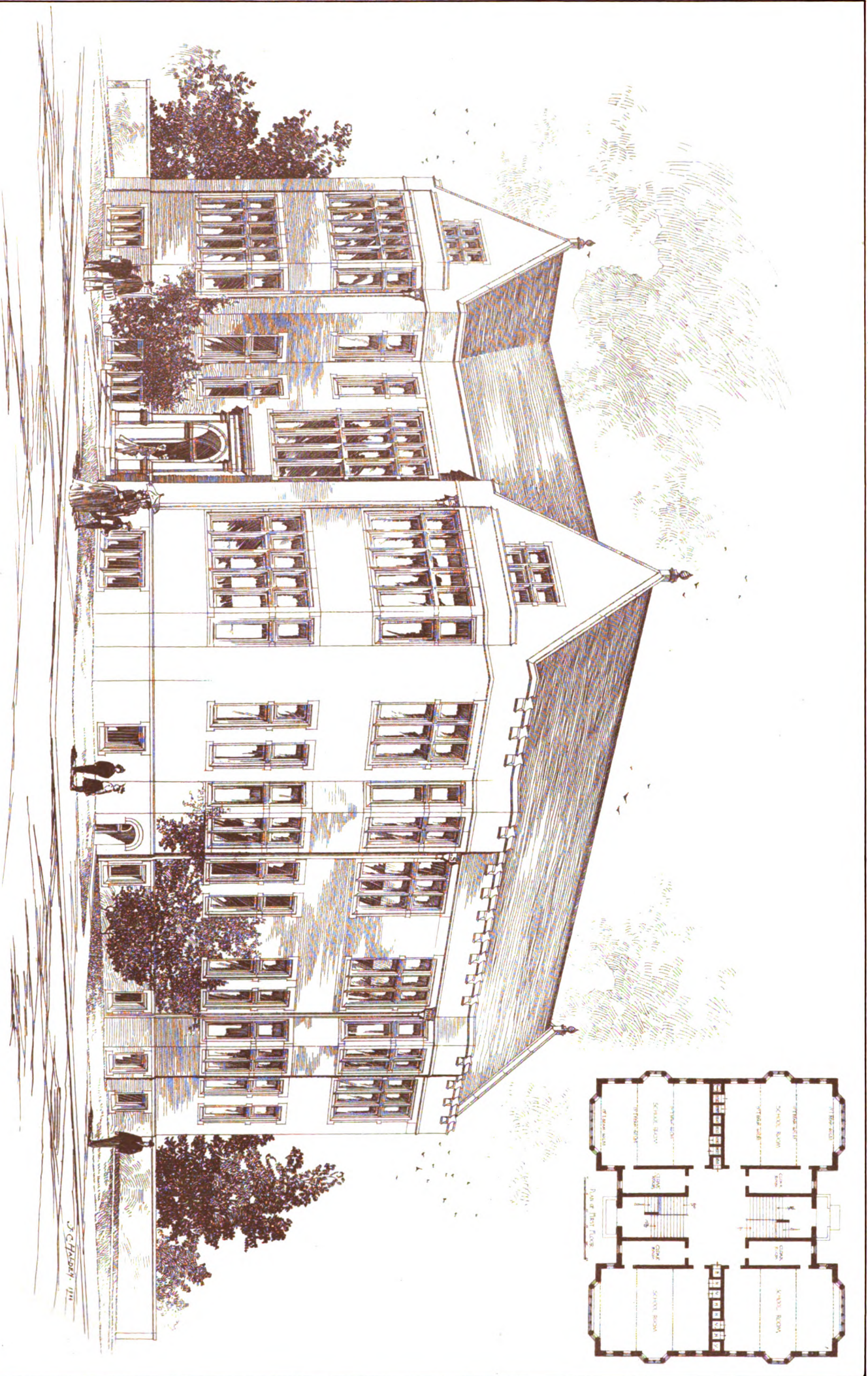
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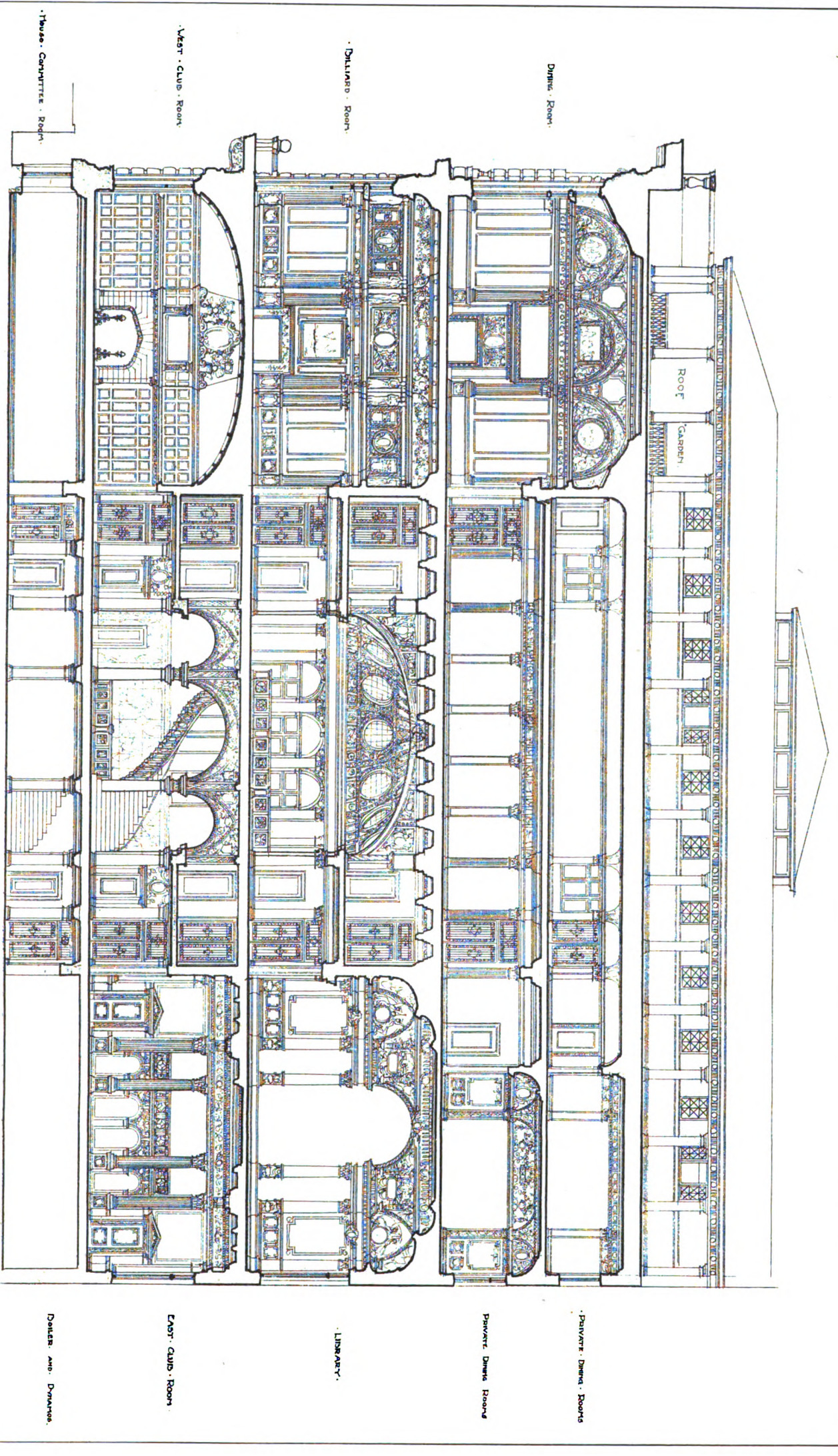
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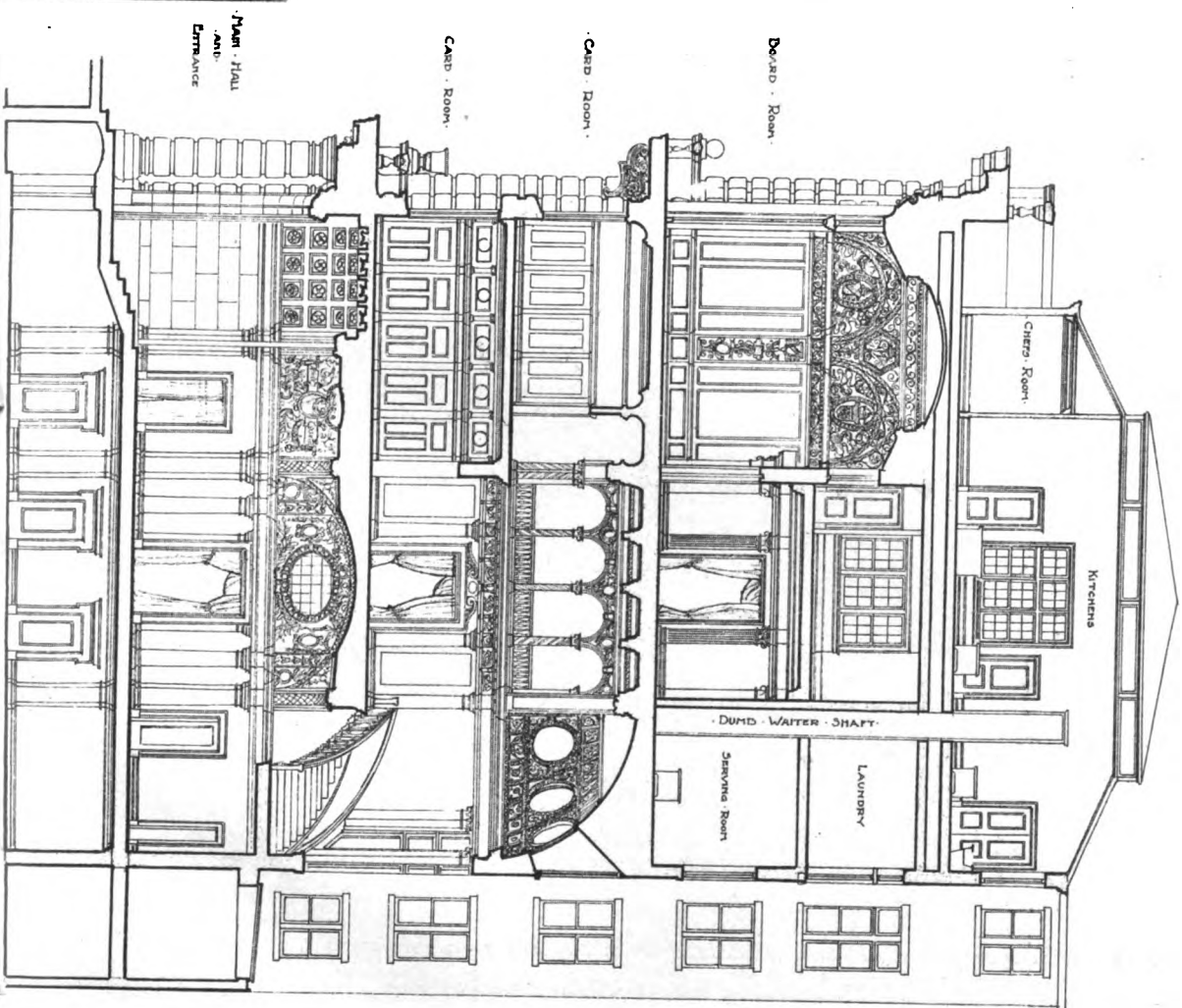
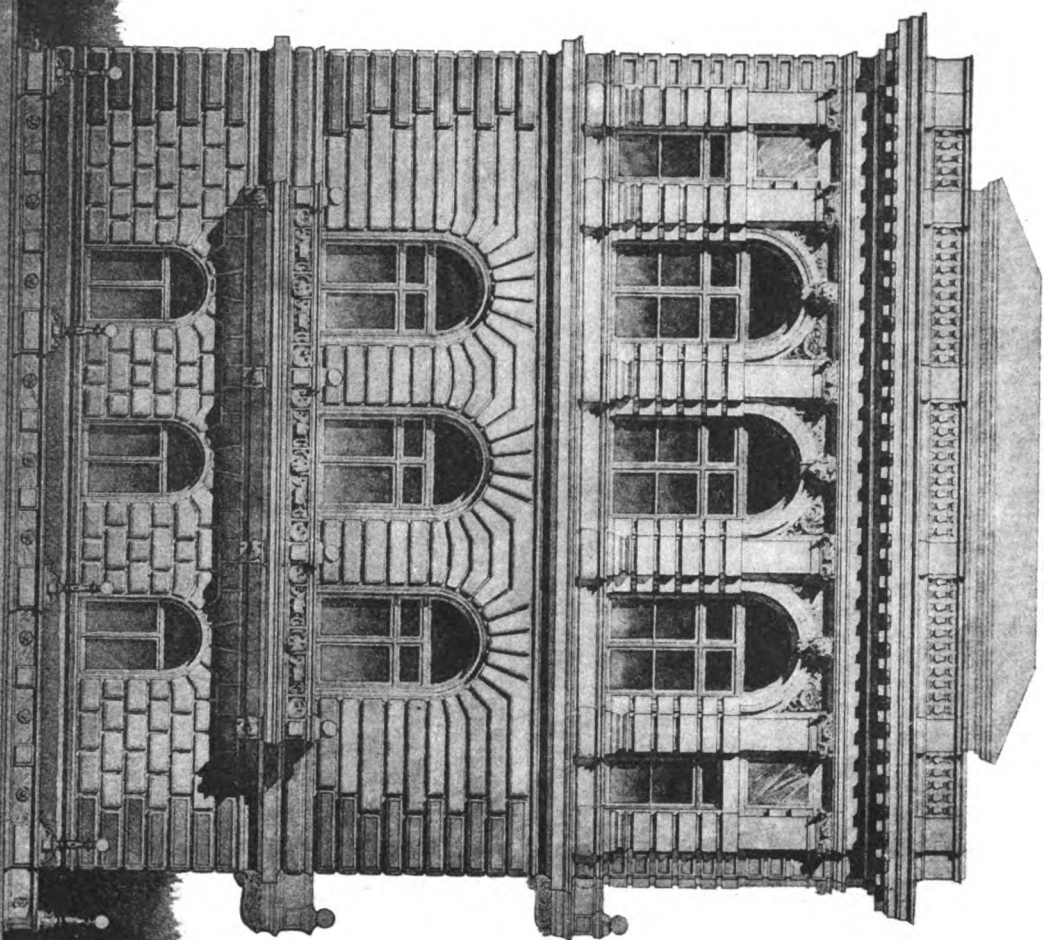
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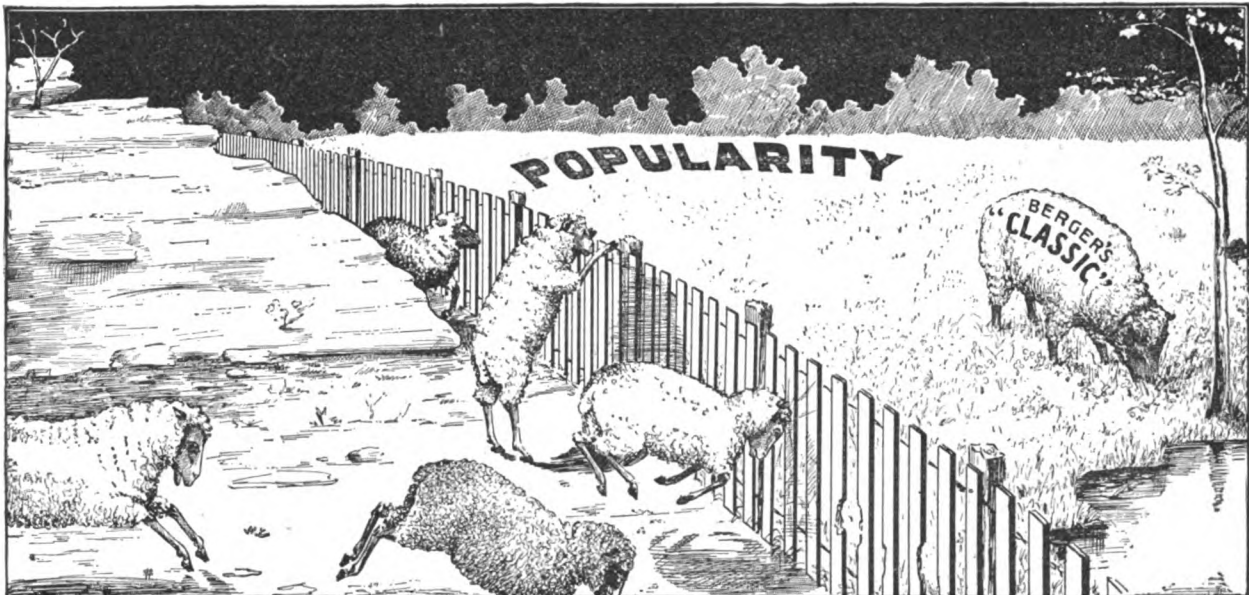
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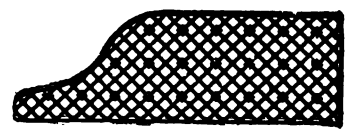
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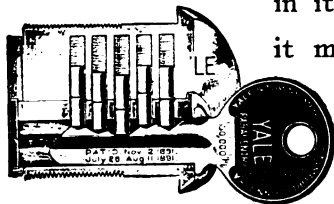
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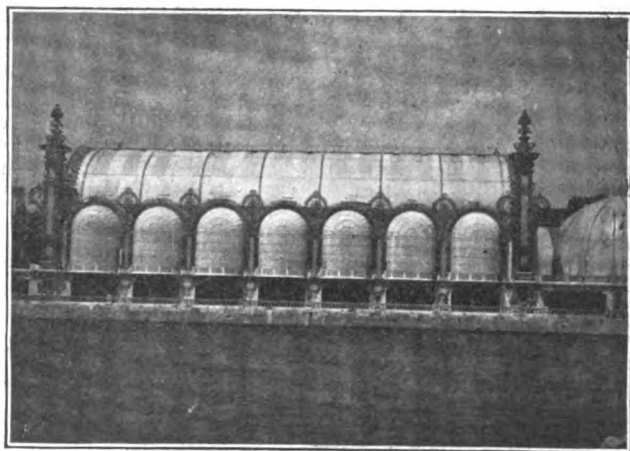
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COOLING WITH EXHAUST-STEAM.



The Horticultural Building: Paris Exposition. M. Gautier, Architect.

OPEN air presents everywhere a level of temperature which can be raised or lowered only by the expenditure of energy. Since both personal comfort and the preservation of food require temperatures materially below those prevailing during a large part of each year, systems of artificial cooling have come into general use. Natural ice, cut and stored during winter months, has long been the most common means for the production of low temperatures on a small, and in many cases, on a large scale. It has been found, however, that where a very large cooling effect is desired at a single point, during long periods, it is much cheaper to maintain the low temperature by the expenditure of energy than to pay the common rates for natural ice. More than this, in places where natural ice can only be obtained from great distances and even in some Northern cities, it has proved economical to manufacture ice on the spot at the time it is wanted for distribution. To change water, at ordinary summer temperatures, into ice requires comparatively large amounts of energy, and the only large and generally available supply of energy is derived from coal. There is thus the seeming paradox that coal burned to generate heat can eventually be made to produce cold. Heat, however, is simply one form of energy, and energy must be employed when any substance is to be changed from the common temperature, no matter in which direction the temperature varies. Most systems for the production of low temperatures, whether for making artificial ice or the direct cooling of apartments, depend on the evaporation or expansion of some vapor, ammonia being the one very generally employed.

Instead of ammonia, water, carbonic-acid and methylic-ether are among the substances that may be used in cooling operations. The ammonia or other cooling agent does not furnish energy, but simply acts as a vehicle to convey heat from the substance to be cooled. To extract the absorbed heat energy from the cooling agent requires the expenditure of other energy, either in the form of heat or of motion, and this consumption of energy constitutes a large part of the cost of artificial cooling. The intent here is not to treat of cooling systems in general, but simply to point out how exhaust-steam may be applied to the purpose. Cooling by those means that require the principal supply of energy to be in the form of mechanical power may therefore be passed as unsuited to the use of exhaust-steam. Where methods are employed that consume mainly heat to accomplish the cooling effect, exhaust-steam is valuable in proportion to the amount of heat it can yield for the purpose. The application of exhaust-steam to cooling operations is particularly desirable because it raises by a very material amount the present low yearly efficiency of steam-power plants. One of the most notable tendencies in the modern development of the industrial arts is that toward economy of motion and energy. Other ages have carried constructive arts to very high degrees of excellence, but seldom or never in the past have the present relations between expended energy and the results attained been reached. Much yet remains to be done, however, before the energy developed in industrial operations will be mostly consumed in useful work. As is well known, the steam-power plant is one of the most wasteful, as well as most common, applications of energy on a large scale to the production of wealth.

Boilers of the best grade are fairly efficient, transferring 75 to 80 per cent of the total energy of fuel into steam. The most improved steam-engines drop far below the ratio established by boilers in the transformation of energy to useful effect, and are able to yield in mechanical work but 10 to 20 per cent of the heat in steam. A result of this condition is that exhaust-steam leaves the engine with more than 80 per cent of the energy it contained on leaving the boiler. Steam-engines seem to be near their point of maximum efficiency and some use must be found for the exhaust if the proportion of wasted energy is to be greatly reduced. The use of condensers has been presumed in the higher figures above given for steam-engine performance, so the actual gain of energy with them is comparatively slight. Moreover, the additional expense and complication of a condensing engine are not acceptable to many users. Another factor that operates

against the use of condensers is the ability to employ exhaust-steam for heating during five or six months of the year. Compared with the small part of the heat in exhaust-steam that can be transformed into mechanical energy by the use of a condenser, heating with the exhaust is a very efficient process. The total heat in one pound of exhaust at open-air pressure is 1,146 units more than the heat in one pound of water at 32 degrees Fahr., and 966 units more than the heat in one pound of water at 212 degrees Fahr. If the exhaust-steam in the heating system is simply reduced to water at 212 degrees, more than 84 per cent of its heat above 32 degrees is utilized. Where the general and desirable practice of heating feed-water with exhaust-steam is followed, much the greater part of the exhaust still remains for general warming purposes. The latent heat in one pound of exhaust-steam, 966 units, is sufficient to raise the temperature of 5.3 pounds of water from 32 to 212 degrees Fahr. So if the weight of exhaust from engines equals the weight of feed-water entering the boilers, only 16 per cent of the exhaust-steam can be condensed to raise the temperature of water entering the boiler from 32 to 212 degrees. As shown above, 84 per cent of the heat in exhaust-steam above 32 degrees Fahr. is extracted by its condensation, and 84 per cent of the exhaust remains for other purposes after feed-water has been heated. The portion of the heat in engine-exhaust available for purposes outside of power-production is therefore 69 per cent. Assuming that as much as 15 per cent of the heat of boiler-steam is absorbed by the engine, there remains for general use, after the feed-water has been heated, 58 per cent of the heat in steam coming from the boiler. An exhaust-steam heating system is thus able to utilize from three to four times as much of the energy of the coal consumed under boilers as are high-grade steam-engines. The combined power and exhaust-steam heating plant may thus have an efficiency of 70 per cent instead of the 10 to 15 per cent possible for the steam-power plant alone. Could this high rate of efficiency for a steam-plant be maintained during the entire year, there would be little room for further improvement. In most latitudes exhaust-steam cannot be used for general heating during more than one-half of the year, while in many places the time during which it is wanted is cut down to two or three months. It is therefore very desirable to find some useful purpose to which the exhaust-steam of large and small power-plants can be put during hot weather. Such a purpose exists in the production of artificial cold, either for the manufacture of ice or the cooling of apartments near the steam-plants. That method of temperature reduction, for which exhaust-steam is well suited, is known as the absorption process.

On this plan, water is charged with some vapor of a low boiling-point, ammonia being much used. This ammonia-charged water is heated in a boiler, called a generator, and the ammonia evaporated. The ammonia vapor passes from the generator to a condenser, where it is reduced to a liquid in pipes that are subject to a flow of cold water over their outsides. A pipe conveys the ammonia-liquid to a refrigerator, a closed vessel where compartments containing the substance to be cooled are surrounded by other compartments that receive the ammonia. Sensible heat is absorbed from the substances to be cooled in the refrigerator, and becomes latent heat in vapor from the liquid ammonia.

Connected with the ammonia compartments of the refrigerator is a space filled with water and known as an absorber. This water rapidly absorbs the ammonia vapor. Two pipes connect the absorber with the generator, and a pump joining one of these pipes maintains a constant circulation between the absorber and generator. The two pipes are so arranged that one conveys a strong solution of ammonia from the bottom of the absorber to the top of the generator, and the other a weak solution from the bottom of the generator to the top of the absorber. The pump moves the ammonia solution from the bottom of the absorber to the top of the generator. Application of heat to the generator supplies energy to vaporise the ammonia held in solution. This energy and more is absorbed by the cooling water of the condenser, where the ammonia becomes a liquid.

In the refrigerator the liquid ammonia absorbs less heat when it becomes a vapor than it gives up in the condenser. To this absorbed heat from the refrigerator an addition is made in the generator and the total sum then rejected at the condenser.

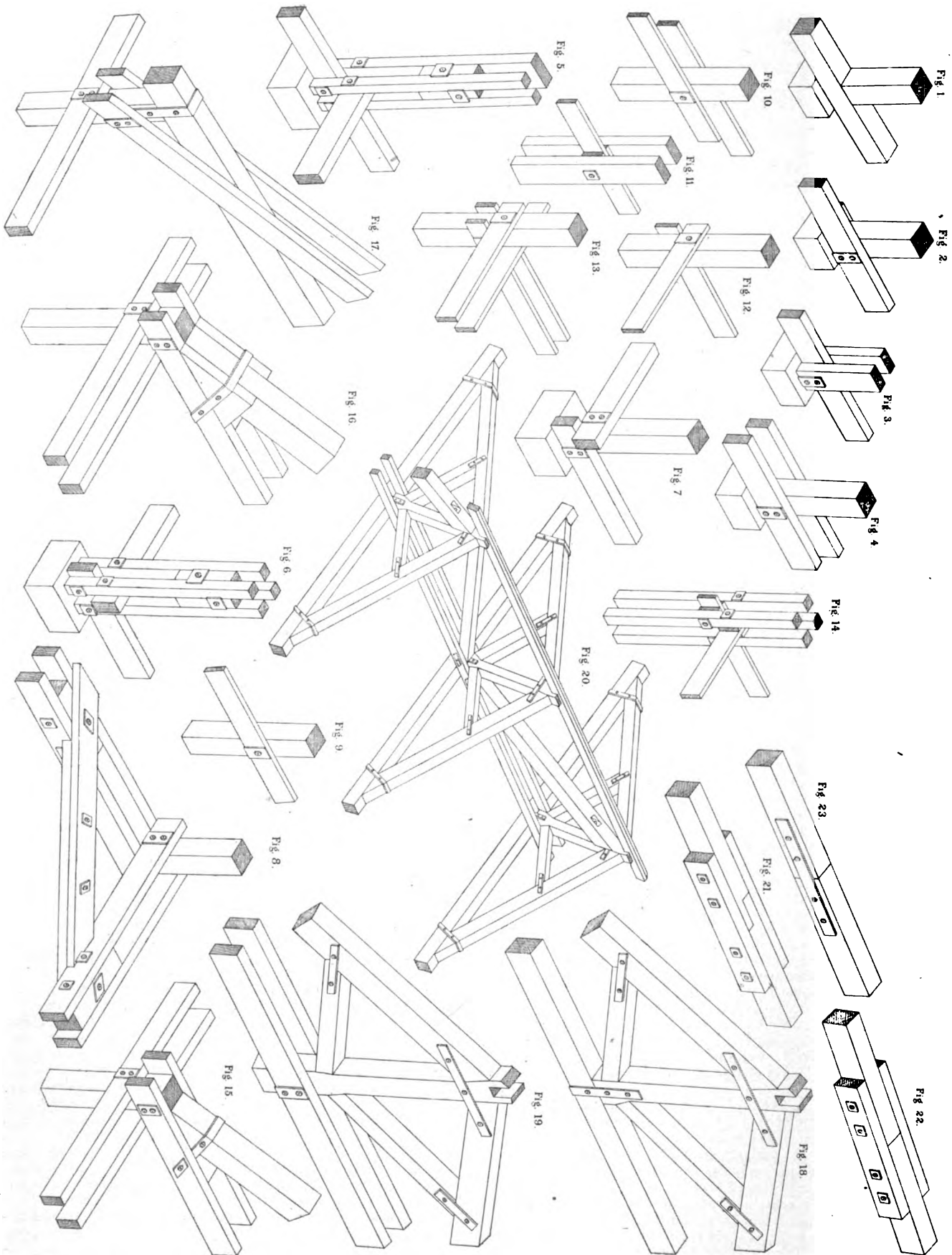
As the process goes on, the ammonia vapor and water that are separated at the generator are united at the absorber, since the weak solution goes from the generator to the absorber, and the strong solution is returned to the generator. The amount of heat required to melt one pound of ice at 32 degrees to water of that temperature is commonly taken to be 142 units. A convenient measure for the cooling effect of refrigerating-machines is found in this absorption of heat per pound or ton of melting ice. Large variations in the cooling effects of refrigerating machinery result from the conditions and adjustments of operation, and depend to a large extent on the skill of the engineer. Under first-class working conditions in absorption-machines an ice-melting effect of about forty pounds per pound of coal burned may be obtained, but in ordinary circumstances results as low as a cooling effect of 20 pounds of ice per pound of coal are not uncommon. The ice-melting effect, being the total heat absorbed, does not represent the amount of ice that may be made by the apparatus. Owing to losses, the ice actually frozen by refrigerating-machines is usually only 6 to 10 pounds per pound of coal burned. The steam to operate pumps that force the ammonia solution from the absorber to the generator is included in the figures just given. A pump consumes one-fourth to one-fifth as much steam

as the generator with which it works. As 58 per cent of the total heat of boiler-steam is available in the engine-exhaust after the feed-water has been heated, more than one-half of the cooling and ice-making results that can be obtained from a given weight of coal are available from the exhaust-steam of a power-plant in which the same weight of coal is burned. In other words, the exhaust-steam for each pound of coal burned in a power-plant can be made to yield a cooling effect equal to that obtained by 20 to 40 pounds of melting ice, or to freeze 3 to 5 pounds of artificial ice. Boiler-steam should be used in the pumps and their exhaust added to that from

exhaust-steam at central electric-stations and many isolated plants.
ALTON D. ADAMS.

THE CONSTRUCTION OF EARTHQUAKE-PROOF WOODEN BUILDINGS.¹

THE construction of earthquake-proof buildings differs in method according to the kind of materials used. But the earthquake-proof buildings which will be built at Sakata, Yamagata Prefecture, where great havoc was wrought by earthquake last October,



the power-plant, the amount of this steam will increase the figures just given for cooling effect. The increasing demand for comfortable temperatures in public buildings during the summer months, and for artificial ice, evidently opens a wide field for the profitable use of

will probably, in view of the conditions of the locality, be constructed of wood. As these structures will comprise public buildings,

¹ Report of Earthquake Investigation Committee, Japan.

shops, and city and country houses, the arrangement of rooms will be necessarily diverse, some being simple and others complicated; the outward appearance of the buildings will also differ, for some of them may be one-storied and others two-storied. The principle of construction, however, cannot but be one and the same, and therefore we give herewith a condensed statement as regards the method of constructing earthquake-proof wooden buildings.

Construction of the Foundation-works.—Materials for the foundation-work may be one of three kinds, viz, (1) Concrete; (2) *wariguri* (broken stone); (3) *rosoku* (stone blocks). The concrete may be made either of cement or of lime, or of both cement and lime mixed; any one of which is better than either the second or the third kinds. Cement concrete is best of all.

In constructing the foundation-work, if the soil should be found too soft or damp, piles must first be driven to afford a firm foundation; but the driving of piles should be dispensed with in places where the soil is dry.

For the foundation or footings to be placed upon the ground-work, flat, broad stones should be selected, and they should be buried in the earth for half of their height.

Construction of the Framework.—In constructing an earthquake-proof building, it is deemed advantageous to use either foundation-sills (*dodai*) or foot-bracers (*ashigatame*), and the method of using them may be seen, (1) In an ordinary foundation sill (as in Fig. 1); (2) in a foot-bracer applied to one side of a pillar (as in Fig. 2); (3) in a foot-bracer stuck between the two pieces of timber forming a double pillar (as in Fig. 3), and (4) in two foot-bracers so fixed as to embrace both sides of a pillar (as in Fig. 4). Should more stability be required in the case of Figure 1, the connection of the pillar and the foundation-sill should be firmly joined by means of iron clamps or straps. In adopting the methods shown in Figures 2 and 4, foot-bracers having a thickness of over one-third of the respective pillars should be used. In case of adopting the method shown in Figure 3, one solid pillar should be used at each corner of a building, notwithstanding the pillar may be weakened by foot-bracer. Still another method is to use pieces of timber as a pillar, as shown in both Figures 5 and 6. In that case, blocks of wood just fitting the space between the pieces of timber should be inserted at every two or three feet, and should be fastened with a metal bond, wire, or bolt, in order to prevent the pillar from bending or twisting.

It is desirable that foundation-sills and foot-bracers should be crossed with a brace at the four corners and fastened with bolts, as in Figures 7 and 8.

One or two through-bracers (*toshinuki*) should be used as in the case of foot-bracers and fastened with bolts, as in Figures 9 to 14; but in the cases of Figures 11 and 14 the blocks of wood should be inserted at both surfaces of the through-bracers.

In the intermediate space between the pillars where no window or door is to be made, or where outward appearance is of no particular consequence, struts should be placed and fastened to the through-bracers and pillars with bolts.

Shikii and *kamoi* (the lower and upper grooved beams, respectively, in which doors or shutters slide) should be fixed to the pillars simply with screws, if possible, in order to avoid cutting into the pillars and weakening them.

Nageshi (a horizontal piece of timber used in the framework of a building) should be attached to the surface of the pillars and fastened with bolts. Moreover, the weak point of the construction at the four outer corners should be strengthened by jointing the *nageshi* with L shaped metal straps. In places, however, where outward appearance is of no consequence, the *nageshi* should be overlapped at the ends and bolted to the pillars.

In regard to the method of combining with the pillars such lateral timbers as *dosashi*, floor-beams and so forth, if possible, only one or two of the timbers should be used in a similar way as in the case of foot-bracers and *dosashi*.

The connection of *keta* (top ties) and pillars should always be made in the same way as that recommended for pillars and their foot-bracers.

The combination of the roof and walling of a building should be effected as in Figures 15, 16 and 17, *e.g.*, either by holding the upper part of a pillar between double tie-beams placed on wall-plates, or by using double rafters and letting the tie-beam fall upon the tenon of a pillar. In both cases, bolts or iron straps should be used in fastening.

Construction of the Roof-framing.—Materials of too great a dimension should be avoided in the construction of the roof, and the construction should be as in Figures 15 to 20, using such scantlings as will be just large enough to bear the weight of the roof itself together with the pressure of the wind and the weight of the snow; and all connections should be effected with thick wire, iron straps or bolts.

Between the principal rafters, struts, or braces, or both, should be used, and the whole frame of the roof should be bound, as in Figure 20, with iron clamps or bolts.

For resisting earthquake-shocks, a light roof is preferable and therefore all roofs should be made as light as is consistent with their function of keeping out the wind and cold. In case of using tiles, it is better to fasten them with nails or wire.

Joints.—Joints in whatever part of a building should be made as simply as possible, for though a complicated joint may seem strong, yet in reality it is weak. It is desirable that a joint should be made

as in Figures 21, 22, and 23, wood or iron fish-plates being fastened with bolts. In making a tenon also, the simpler its form the better.

In case a jointed pillar is to be substituted for an ordinary one in building a two or three storied house, the joint of such post should be made at a point about two or three feet either above or below the upper floor-line of the house.

Foundation-sills (*dodai*) foot-bracers (*ashigatame*), *toshinuki*, *dosashi*, *keta*, floor-beams and tie-beams should all be fixed so as to project somewhat at their outer extremities.

Attachment of a Porch or a Shed with the Main Building.—As regards attaching a porch or a shed to the main building, the old method of tenoning or nailing should be entirely abandoned, as it is dangerously faulty, and the two structures should be joined in the same manner as *keta* and pillars are connected.

Materials.—As the quality as well as the size of iron materials has an important bearing upon the construction of a building, serious attention must, of course, be called to the selection of materials and also to the number and distribution of bolts. Besides, the size of washers should be considered, large ones being preferable to small.

Wooden materials are subject to shrinkage, owing to which the bolts lose their tightness, and therefore well-seasoned timbers should be selected.

Conclusion.—The most essential points in regard to the construction of an earthquake-proof wooden building lie in the method of building the foundation; in the preservation of the entire power and function peculiar to each timber intact as far as possible, and in case some weakening be unavoidable, re-enforcing it by the application of iron that is much stronger than wood; in the use, wherever possible, of triangle frames, in accordance with the principle that a triangle affords an unchanging form of structure; and, finally, in the additional strengthening of the whole framework by the further use of iron materials, thus combining all the parts into a stable and united construction. — *Indian Engineering.*



[Contributors of drawings are requested to send also plans and a full and adequate description of the buildings, including a statement of cost.]

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PLANS AND SECTION OF THE SAME.

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NOTES AND CHIPPINGS

A REFORM IN FRENCH GRAMMAR.—There should be rejoicing in every school-room not only in France and Navarre, but also wherever French is taught. A beneficent decree emanating from the Council of Public Instruction, the sovereign pedagogic body of the country, ordains that henceforth French syntax and orthography are to be simplified. The grammar is to be purged of certain obnoxious difficulties that have never served any other purpose than to try the memory and patience of successive generations of scholars. This important reform will deprive some of the most distressing chapters in the French grammar of their worst terrors. First and foremost, be it noted, the unsurpassably terrible chapter which deals with the past-participle of verbs conjugated with *avoir* is suppressed altogether. As every student knows to his misery, the agreement of these participles with the object was governed by rules of such hair-splitting nicety that the grammarians themselves were at loggerheads with regard to them. For the future these participles are always to be invariable, and this welcome immutability is to be extended to the past-participle of reflexive verbs. Thus, it is now permissible to write: "*Les livres que j'ai lu*" and "*Elles se sont tu*." Another simplification affects those perplexing nouns that have hitherto been of two genders. Henceforth they may be of either gender, according to taste. You may say, "*Les grandes orgues*" or "*un des plus grands orgues*," the adjective coupled with *gens* may be masculine or feminine, as you prefer, and to make *orgues*, *paques* or *période* feminine is to cease to be a heinous grammatical offence. But in the case of substantives the most gratifying innovation is in connection with the plural of composite nouns. These plurals in the past were a crux of the first magnitude. For instance, you had to write *timbres-poste* and *paquebots-poste*, but for some inscrutable reason the plural of *train-poste* was *trains postes*. For the future, the essential rule is to be that the plural is to be formed in the simplest manner possible by adding an "s" to the end of the last word. Pedantic people are still to be at liberty to stick to the old orthography, but it will be as legitimate to write *coffre-forts* as *coffres forts*, or *basse-cours* as *basses cours*. Again, *chefs-d'œuvre* is to be tolerated as the plural of *chef d'œuvre*, and *têtes* as that of *tête à tête*. Besides ordering these changes, and many others there is no room to mention, the Council speaks out boldly in favor of the reign in a general way of simplicity and common-sense in matters grammatical. It indulges, in particular, in a shrewd thrust at examiners, who, in France, as elsewhere, delight in "stumping" their victims by setting them questions dealing with trumpery peculiarities it would be better to neglect. Altogether the Council has deserved well of mankind. It has done something to deliver the French school-boy from the dreaded *cole*, and it has lightened for humanity at large the task of learning French grammar. — *Paris correspondence of the Pall Mall Gazette*.

FELLING OLD CHIMNEYS.—Of the method of felling old chimney-stacks by burning out inserted props devised by James Smith, of Rochdale, Eng., the *Scientific American* says: "In felling a chimney, the stack is first thoroughly examined and careful notes made as to its height, weight and condition. A survey of the surroundings is then made to ascertain which is the best direction in which to overthrow the structure, and so long as the available area which is to receive the mass is a little more than the length and breadth of the stack, it is sufficient. Having determined upon the direction of the fall and the available area to receive the stack, an incision is made in the centre of the chimney at a height of 5 or 6 feet from the ground, facing the direction in which it is to fall, and corresponding cuts are made on each of the sides. As the bricks are removed, an underpinning of 6' x 6" timbers is inserted, the work being carried on until about two-thirds of the base of the stack has been so treated. By this time the stack usually is listing over slightly in the direction in which it is to fall, the list being an indication that the chimney is resting almost entirely upon the underpinning. At the same time on the reverse side of the chimney there will appear a slight crack in the masonry. The underpinning is carried on until this fracture appears, for unless the greater part of the structure rests upon the supporting-posts, the direction of the fall can by no means be predicted with certainty. The gap made in the base of this stack must be of sufficient width to cause the structure to drop and telescope when falling. If only a narrow gap were made, the stack would simply pivot on its base and come down intact, measuring its length on the ground; but as it is desired to concentrate the debris, a sufficient gap is made at the base to ensure that as the stack leans to its fall it will drop a few feet vertically *en masse*, the jar thus given to it causing the mass to crumble upon itself. As soon as the underpinning is complete, a fire of highly inflammable combustibles is built and the props are thoroughly saturated with oil and covered with pitch and tar. On the occasion of the felling of a stack at Preston, which was 250 feet in height and weighed over 3,500 tons, there was consumed in burning out the underpinning 6½ tons of coal, 4 tons of pitch, 40 sacks of shavings, 108 gallons of tar and 120 gallons of paraffine. The burning of the props has to be most carefully watched, since it is necessary that they all collapse at the same time to ensure that the chimney will fall in the desired direction.

CATALPA TREES AT WESTMINSTER.—All who have visited Westminster in this fine weather must have been struck by the magnificence of the row of broad-leaved flowering trees which flank one side of Bridge Street under the Clock Tower. The trees, which were planted about twenty-five years ago, present in most summers no more than an agreeable splash of green in the midst of the glare of the surrounding buildings and the great court-yard leading to the House of Commons. But this year they have burst forth into an unwonted exuberance of large white blossoms, which hang in graceful clusters and contrast

charmingly with the dark-green leaves below and around. The tree is a variety of the catalpa, two species of which are found in the United States and two in Japan. The common catalpa (*Catalpa Bignoides*), known also as the bean tree, catawba, Indian-bean, and cigar-tree, was discovered and named in 1726. It is found chiefly in the Gulf States, but has been acclimatized in Europe, and is used largely for ornament in the South. One or two good specimens are to be found in St. James's Park, and there is a remarkably fine young catalpa in full flower in the Inner Temple Gardens, where it seems to flourish with a vigor and beauty denied to the traditional white and red roses of the Houses of York and Lancaster. — *Westminster Gazette*.

A NEW WATER-POWER ON THE ST. LAWRENCE.—A good instance of the enormous growth and importance of the electro-chemical industry in the United States is afforded by the huge power-plant of the St. Lawrence Power Company at Massena Springs, N. Y. This installation will take advantage of an extremely curious configuration of the country, whereby the St. Lawrence River is nearly 50 feet higher than one of its tributaries, the Grass River, which is only three miles distant. A canal cut across this short stretch of country gives one of the best water-powers in the world and no less than 150,000 horse-power, or three times that generated in the great plant at Niagara, will be produced. All of this gigantic power will be used on the spot in electrolytic processes for the manufacture of calcium-carbide, bleaching-powder, alkali, etc. — *Exchange*.

REPORTERS' COPYRIGHT.—The recent decision of the House of Lords, which was given in favor of the London *Times* and against Mr. John Lane, who had republished a volume of Lord Rosebery's speeches, taken from the stenographic reports in the *Times*, has evidently opened a new field for reporters. Mr. Lane has received the following note: — *Dear Sir*, — Since the reporter has been adjudged the owner of copyright in a speech, may I draw your attention to the fact that there are many speeches made annually by various speakers which would have considerable value as literary productions. As a verbatim author I beg to offer you the next half dozen speeches to be made by the Lord Chief Justice, Mr. Balfour, Lord Rosebery, Mr. Birrell, Mr. Asquith and Mr. John Morley. They could be brought out as a volume of copyright literary essays, and as there appears to be no necessity for stating by whom the speeches were made, I, as the author, would of course stipulate that my name should appear on the title-page. — *N. Y. Times*.

THE TELEPHONE FORESHADOWED IN "PUNCH."—The old saw that many a true word is spoken in jest finds an admirable illustration in a quotation from *Punch*, of December 30, 1848, which is published in the *London Electrical Engineer*. The quotation, which foreshadows the telephone in a remarkable manner, is as follows: "Our attention has been directed to an article made of guttapercha called the telakouphanon, or speaking trumpet, a contrivance by which it is stated that a clergyman having three livings might preach the same sermon in three different churches at the same time. Thus, also, it would be in the power of Mr. Lumley, during the approaching of the holiday time, to bring home the opera to every lady's drawing-room in London. Let him cause to be constructed at the back of Her Majesty's Theatre an apparatus on the principle of the ear of Dionysius, care having been taken to render it a good ear for music. Next, having obtained an Act of Parliament for the purpose, let him lay down, after the manner of pipes, a number of telakouphanon, connected (the reader will excuse the apparent vulgarity) with this ear, and extended to the dwellings of all such as may be willing to pay for the accommodation. In this way our domestic establishments might be served with the liquid notes of Jenny Lind as easily as they are with soft water, and could be supplied with music as readily as they can with gas."

CANAL LOCKS AND LIFTS.—The means of overcoming the difference of level of the country through which canals pass is in most cases the employment locks placed either singly or in flights, depending on the height to be overcome. About twenty-five years ago, the locks between the Trent and Mersey Canal and the River Weaver, where there is a difference of 50 feet, were superseded by the hydraulic lift at Anderton. The boats here are floated into iron troughs, which are raised or lowered by hydraulic power, one boat ascending and another descending at the same time. This system was subsequently adopted on other canals in France and Belgium, and, with some modifications, in Germany. What is claimed as an improvement on this system is now being carried out on the Erie Canal in America, at Lockport, by what is termed a "Pneumatic Balance Canal Lock." A description of this lift was given in a paper contributed to the Franklin Institute by Mr. Chauncey N. Dutton. The existing stone locks were erected in 1836, and overcame a lift of 62½ feet by means of five flights. The lock which is being erected to supersede these consists of two steel chambers, one for ascending and the other for descending boats. These chambers are divided into two parts, the upper one containing water to receive the boats, and provided with gates, as in the case of the Anderton lift; and beneath this a second chamber containing compressed air on which the lock-chamber floats. The air-chambers are so proportioned that they automatically differentiate the air-pressure. The water in the lock-chamber which contains the boat at the upper level is so adjusted that its weight, with the boat it contains, is 200 tons greater than that of the lower one. Each of these locks weighs 1,500 tons and contains 4,500 tons of water, the weight in motion, when the boats are ascending and descending, exceeding 12,000 tons. The advantages claimed by the use of compressed air are a saving in cost and in working. — *Indian Engineering*.

WHAT A YEAR'S WORK MEANS.—A well-known economist has figured out that out of ninety-eight chief national industries in a given year only twenty-nine gave men work 300 days in the year. — *N. Y. Evening Post*.

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HERE is one class of document issued by the Government of this country which we treat with scant respect. The announcements of examinations to be held by the United States Civil Service Commission always excite our indignation and are always thrown into the waste-basket without our taking any action on their subject-matter. Not that we do not believe in civil service, for we do heartily; not that we would not aid the Commissioners in procuring a good grade of public servant, for we surely would do so if we could do it without at the same time lessening our self-respect. But it so revolts us that the Government of a great and supposedly civilized country should treat one of its own bureaus in the shabby way in which the Civil Service Commission is treated that we will have no share in it, even if by so doing we prevent some worthy draughtsman from procuring a desirable berth. These announcements are sent out to publishers with an apologetic explanation that they must be published at the expense of the publisher, as the Government is unwilling to provide the Commissioners with an appropriation large enough to pay for the advertising which is legitimately necessary for the performance of its assigned duties. Is not this a nice condition of affairs? One of the official bureaus of a great and wealthy country forced to beg and cringe to the needy publishers of newspapers in order to get before the public announcements which must be made, if the Government's promises in the matter of civil service are in any degree to be made good! To deny publication to these notices is, of course, to hamper the work of the Commissioners, but we greatly prefer to do this than feel that we are joining with the Government in the execution of an action whose shabbiness is only equalled by its pettiness. The Government blandly squanders thousands and millions for all sorts of unworthy objects, and knows that it does so, and so, perhaps, there is nothing surprising in its treatment of a Commission whose purpose and aims are abhorrent to those in whom the power at present vests. It is shameful none the less.

THE ingenuity of American engineers has made a reputation for the country in no more spectacular matter than in the moving of great buildings from place to place, and foreigners seem never weary of expressing their wonderment at and often their entire disbelief in the accounts that are published in the daily papers and technical journals. At home here, we see nothing remarkable in moving a building onto scows and towing them across, say, the bay of San Francisco, or placing one on runners and drawing it across a New York lake, or building special railroad tracks and moving a great hotel several hundred feet back from the encroaching sea by the agency of forty locomotives, as was done in the case of the Hotel Manhattan. Even the migration of the buildings of an entire town on wheels, such as we chronicled a few weeks ago, seems to us merely an amusing, but not a particularly unusual, event. Perhaps the longest journey a building ever took was when the

old stone jail was moved from this city to San Francisco, but in this case the building was taken down stone by stone and freighted to the Pacific Coast round the Horn. This event was interesting, too, because it was found, we believe, that the stones were joggled together with cannon-balls. The name of the Hotel Pelham, Boston, will always be familiar in the annals of building, as that was the first large masonry building that was moved horizontally from its old to its new foundations, although the vertical jacking-up of masonry buildings was not a novelty. So, too, the fame of the Carnegie Library building, at Pittsburgh, is likely to be similarly remembered, if its projected removal is actually carried out, for it seems hardly likely that an attempt will ever be made to move so large and complicated a building so great a distance under circumstances so little advantageous. In speaking of these audacious undertakings we must not forget that amongst the most dangerous and delicate of them all are the movings of several great mill chimney-stalks, and, perhaps, there should be included in the same category the moving, floating to position, and sinking of the caissons for light-houses, as at Diamond Shoals, Cape Hatteras, and elsewhere. It is in the performance of such feats as these that the architect is the first to appreciate and applaud the skill of the engineer.

THE latest to join the ranks of peripatetic buildings is the Hotel Wollaton, Brookline, Mass., a structure that has had a most disastrous career, although a short one—it was begun only in the year 1897,—it having already once been moved back on its lot for a distance of twenty feet owing to a relocation of the street building-line. As the architect of the building is a man far from unfamiliar with the duties involved in the safe erection of a heavy building, it is fair to suppose that he, knowing the site was marsh-land, made all proper soundings and wisely prepared suitable foundations. Indeed, it is supposed that the troubles that overtook the building were in some way a consequence of its first forced removal. Be that as it may, the unusual character of the operation attracted the attention of the public as well as the local building department, and criticism soon became frequent, as structural defects due to uneven settlement began to declare themselves. Finally, the matter caught the attention of the State Inspector of Buildings, with the consequence that the tenants of the building, an apartment-house, were required to vacate it while further attempts were made to restore it to usefulness. These proved fruitless, and after the unfortunate building had consumed over a hundred thousand dollars of the owners' money, it was, after standing deserted for months, abandoned to the mortgagee, who has just sold the property to new owners for about a third of its cost. An attempt is now to be made to move the building, which weighs some forty thousand tons, through a distance of one hundred and thirty odd feet, to a new foundation prepared for it on a somewhat better site. So far as the moving of the building is concerned there are no unusual problems involved except those required in bracing and tying together a somewhat dislocated structure. The main interest centres on the possibility of preparing a permanently good foundation, and as the new owners have got the property at bargain rates, they have a large margin to consume on moving-operations and the new foundations before their investment passes the fair income-returning limit, so the structure is likely to have a long and useful career yet.

THE pocket nerve is so very sensitive a measure of what, from a pecuniary point-of-view, it is well to do that insurance men are very keen observers, and as there are nowadays so many different kinds of insurance which each yields deductions of so many varied kinds, a great deal of curious and useful information can be obtained from a careful reading of the insurance journals. Thus, a certain plate-glass insurance company has forbidden the writing of risks on glass in doors, windows or inside partition-sashes which have either been wholly painted over, to secure opacity, or any considerable portion of whose surface is occupied by painted decoration or lettering. The reason for this rule lies in the alleged fact that glass so treated retains heat longer than the plain glass, and so is likely to splinter under the unequal contraction due to a sudden change of temperature. Another curious fact is that burglary insurance, which was introduced here eight years ago

and is now a profitable branch of the business of some companies, caused the ruin of the companies which undertook the introduction of this kind of business. The reason for this failure is that these early companies adopted the tariff that was found profitable in England, but it was quickly found that the premiums charged would not in this country nearly cover the actual losses, and failure inevitably resulted. Now, as we do not believe that American burglars are any more audacious and skilful than English ones — in fact, we seem to remember that in many cases in this country the skilful operator's biography reveals the fact that he is an Englishman who had to leave home because things had become too hot for him — it seems just possible that American buildings are easier to crack than English ones, and for this defect architects may, in a measure, be responsible.

A CURIOUS matter in which the question of salvage, if not insurance, is involved is reported as occurring in this city, under circumstances that would have rejoiced the heart of Professor Pettenkoffer. It appears that amongst the produce stored in one of the chambers of the Boston Cold Storage Warehouse were several thousand dozen of fresh eggs, which were to be put upon the market later, when fresh eggs are a scarce delicacy. A shortness of the visible supply led to a sale of some of these eggs recently, and this, in turn, to the discovery that the eggs, although evidently not stale, none the less certainly conveyed to the taste the flavors of divers kinds of fruits. As the egg-shell is made porous, so that the chicken may breathe during the last stages of incubation, it is not surprising that eggs immersed in a strongly flavored atmosphere should absorb into their contents some portion of the flavoring, if they are subjected to changes of temperature, or if they are, when warm, carried suddenly into the cooling chamber. But it is understood that the chamber where the eggs were stored had been used only for that purpose, and never for fruit. If this is so, it looks as if there had been established under atmospheric pressure, due to the varying temperatures of different storage-cells, a series of air-currents passing through the brick partition-walls, and carrying from one cell to another so much flavoring matter that the filtering properties of the brickwork could not absorb it all, but allowed enough to remain to find its way through the seemingly impervious egg-shell. Although injured, the eggs can still be used for cooking purposes, and as the salvage will for this reason be considerable, the insurers, or the storage company, will not have to pay a total loss upon them.

IT appears that the citizens of Massachusetts, too, have an interest in the matter of the relation, or the want of relation, between the militia and the members of trade-unions, to which we referred last week. The matter comes to light through the attempt of a member of a brewers' union, still in good standing, to get relief through the Supreme Court from a boycott that the union had established against him for some undiscoverable reason. The sitting judge required counsel to argue the matter of the Court's jurisdiction and, finding himself in doubt, is to report the case for the consideration of the full Bench. Thus far, the case has no very unusual feature, but it is reported that the judge was "particularly interested" in the statement, made by plaintiff's counsel, that all members of this Brewery Workmen's Union are required to take oath that they will not join the State militia before they can be admitted to membership. That this is a very interesting point few will be disposed to deny, and it is very desirable that it should, in these days of potential anarchy, be considered by a court that stands as high as that of Massachusetts. We hope, therefore, that this matter will not escape attention and that the Chief Justice may write the opinion, for Judge Holmes, we believe, is rather inclined to take the ground that even the abuses of strike and boycott are not such very bad things after all, while, as a distinguished veteran of the Civil War, a believer in the strenuous life, and an exhorter of youth to do their full duty as citizen-soldiers in time of need, it seems as though his inclinations would be strongly strained in opposite directions, and it would be interesting to learn whether his sympathy for the working-man or his belief in the obligation of every citizen to do his duty in upholding laws and courts will finally prevail.

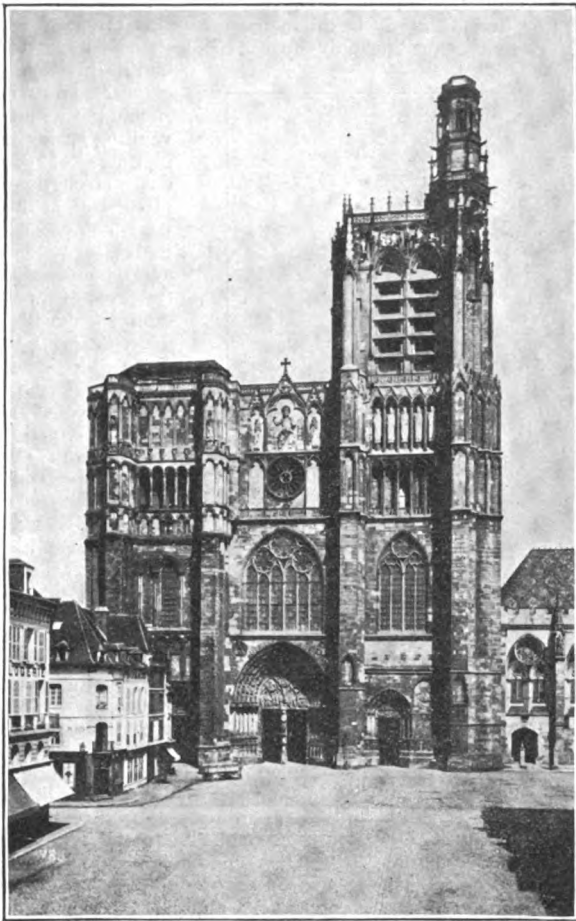
"SCENE-PAINTERS' architecture" as a term of reproach applied to the efforts of youthful and ambitious practitioners is not so common nowadays as it used to be, and there is good reason for this in the fact that the scene-painter's

work itself is vastly different from what it used to be, and an architect can now sit through a play staged by Irving or Daly without squirming at sight of the hash of architectural styles, proprieties and proportions the scene-painter has made. We know that architects have not infrequently been employed by stage-managers to furnish sketches for interior and exterior side-flats and back-drops, and a few have, like the late E. W. Godwin, delighted to provide sketches for the *costumier* to follow when an historical drama was in preparation. Unquestionably, then, the stage and play-goers owe some of their pleasure to architects, and it is quite time that the theatre should bestow a reciprocal benefit on architecture, and, curiously, the first item to be placed to the credit of the theatre is due, not to the effect of the serious drama, but to the comic opera. Never having had the pleasure of seeing and hearing the opera "*Les Cloches de Corneville*," we do not know under what guise the scene-painter elected to present the belfry. Evidently, though, it was an attractive one, and it suggested to the Marquis de la Rochethulon, a descendant of the hero of the legend on which the opera is based, that, as the actual church at Corneville had neither belfry nor chimes, it would increase the harmony of fact with legend if a belfry should be added to the church. Acting in conjunction with a committee, he has at length secured the needed funds, and a chime of twelve bells, each appropriately named, is now being cast. As nothing is said as to the weight of the bells, it is impossible to guess whether their installation will require any considerable reconstruction of the tower in providing a belfry for their reception. To hear, over the plains of Normandy, distant bells chiming some of the beautiful airs from the opera will surely be an enjoyable experience for the theatre-going traveller.

HOW far it is judicious and worth while to make public reply to public criticism every man must judge for himself. Some authors vent their spleen upon or make a calm and dignified reply to the unfavorable reviewer of their last book, and some artists have been known to bring suit against the critic who dared to damn their latest efforts with something less than faint praise. English architects, judging from their weekly journals, are not averse to replying to the criticisms that may be made of their work, but American architects seem inclined to reason that people are too busy to remember tomorrow that some one had flouted them the day before, and so one rarely finds an American architect making public reply to an unkindly criticism. In fact, it would seem nowadays hardly needful to make serious reply, since the aggrieved artist need only to assert that his work was "inventive" or "indigenous," and so not subject to the laws which the unfavorable critic rested on. The architects of New York's new City Prison, however, have found it desirable to make a public reply to those eminent art-critics the members of the Central Federated Union, amongst whom are numbered the stone-cutters who have been so carefully watching the progress of that building and have declared that the coat-of-arms carved over the entrance is all wrong and no true work of art. As a piece of rhetorical writing this reply is not particularly commendable, but it may serve as a denial that there is anything wrong about this sculptured escutcheon, and as a statement that it will not be re-cut under union auspices.

BECAUSE of the number of complaints that reach us, it seems desirable to make an explanation that should hardly be necessary. Many subscribers who have just received their copy of the Sixth Part of the "*Georgian Period*," which is just published, write to ask us to substitute a perfect copy for the seemingly imperfect one they have received, pointing out that the text-pages begin with the seventeenth folio. The complaint is made in forgetfulness that the previous Part contained the first sixteen pages and that in the table of contents of that Part, as in that of the present one, especial care was taken to indicate at just what points the text-pages were intended to begin and end. It was intended at first to make each Part of this publication complete in itself, so that purchasers might procure one or more Parts at their pleasure and yet have these fragments entirely useful, but it has been found not quite possible to carry out the plan. But as purchasers seem inclined to take up each Part as it appears, the abandonment of the scheme is not likely to work injustice to any one, and if an eye is kept on the table of contents a hasty complaint of carelessness on the binder's part can be avoided.

A CORNER OF OLD FRANCE.—I.



West Front: Sens Cathedral.

THE twelve hours' journey which, a hundred years ago, would barely convey our ancestors by grievous travelling from London to Canterbury will to-day suffice to carry us over land and sea to the city of Sens, which is in a manner Canterbury's parent. That William of Sens who labored at the Canterbury choir and, as some say, planted the pointed arch in England, worked in 1168 and the preceding years at the gracious cathedral which, if you arrive at Sens late at night, will first greet your eyes over the roofs of the inn courtyard when you wake on the first morning of a fortnight among the churches of Burgundy and Le Morvan. Sens has a fair river, clean streets and quiet beauty, but save for purposes of a pleasant ramble there is little in the town to draw the attention away from its tall and grand Cathedral. The transepts, with their rich doorways, are of late date — the beginning of the sixteenth century. The vast west portals, which are of the date of the nave, are full of detail, but sadly mutilated: the greater part of the statues were destroyed in the Revolution, but the image of St. Stephen survived by virtue of the inscription on his open volume — "Book of the Law."

Within there is much to remind us of Canterbury, particularly in the form and carving of the Transitional capitals. The piers, alternately clusters and coupled shafts, originally supported a sexpartite vault, which gave way to a fresh arrangement after a fire at the end of the thirteenth century. The glass, which is splendid, is another reminder of Canterbury, not merely in similarity of effect, but also because one of the windows illustrates the legend of St. Thomas à Becket, a saint who is yet again recalled to us in the little treasury, entered from the south aisle, by the beautiful and authentic vestments there preserved, chief among which is his interesting chasuble.

The "Officialité," a structure on the south of the west façade, which fairly shouts its acknowledgments to Viollet-le-Duc as a restorer, is rather dull as a building, but is worth visiting (by stealth and without a guide), for it contains some good altar ornaments and church-wares, one of which, a service-book, is stencilled throughout: words, music and adornments.

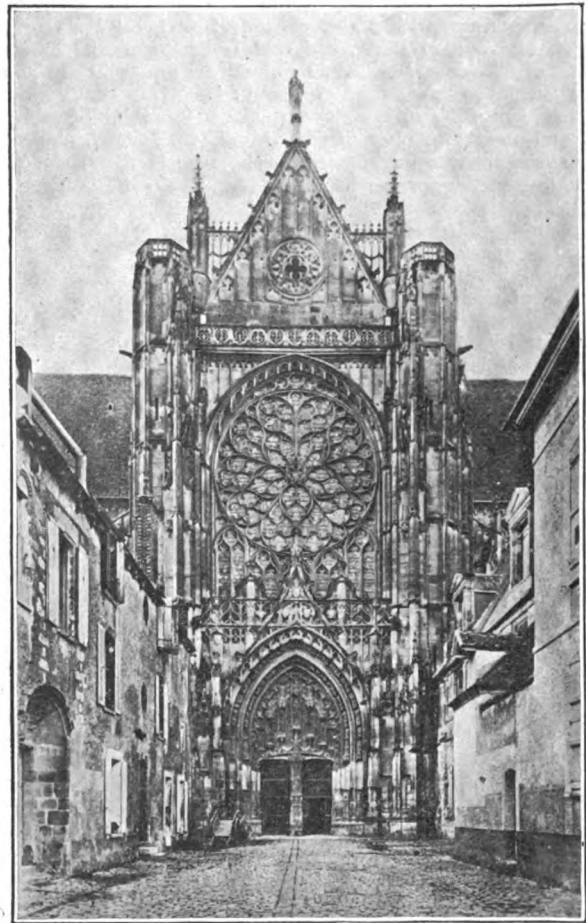
From Sens it is our business to get on to Auxerre, and this we can do by way of Villeneuve and St. Julien-le-Sault, small hamlets both, which, though full of the charm which always besets a French town which is both old and out of the way, need not long detain a traveller, who for reasons best known to the nineteenth century has to treat time as an enemy. It is a long while since Villeneuve was a new town; may it be long before it becomes an ugly one. It has two main streets which make for picturesqueness. One of them, the longer, has a jewel of a town-gate at each end, behind and through which the bright green of tall trees bears testimony to

the invariable beauty of abrupt transition between town and country. Suburbs are a town's disgrace, not merely by inherent and, as it seems, inevitable ugliness, but by the fact that they are the negative of that sheer contrast of masonry with nature by which, if it is not blasphemy to say so, man's work and his Creator's both seem to gain. Villeneuve's other street leaves the town by a bridge, sitting on the parapet of which one looks up the roadway to the rather gaunt but very comely Renaissance front of the Church of Our Lady. This front was built in 1575, by one Jean Chéreau, of Joigny, and, though its detail is all of the Classical spirit, is no outrage in general composition upon the thirteenth-century work of the interior. There is a fine Gothic apse, and some good glass of both the Gothic and Renaissance periods.

Auxerre, one of the choicest spots of this little pilgrimage, is one of those places which, as you pass it in the train, fairly calls out to you to stop. It has all the elements of beauty in town creation. A hill to stand on, a broad and full river to wash its feet and to run under its bridges, four good churches in an area of about a quarter of a mile and a generally compact formation surrounded by boulevards of well-grown trees. The Cathedral of St. Stephen is, I think, memorable more for its outside than for its interior. Its triple doorways, once richer than they now appear, are good bits of thirteenth-century (and later) work, and of the two towers, the only one that is finished is elaborate and delicate. I think it will be owned that in this as in many another European church, the apparent adversity which prevented the completion of both the towers has really been a boon. The Cathedral of Auxerre with two towers would be commonplace; with one it is distinguished. The interior, though good enough, is in a country of so many beauties likely to be hurried through, but the glass is fine, and the carving elaborate.

St. Germain — an abbey church — is pathetic as well as beautiful; it has about it a melancholy more profound than that of a ruin — the melancholy of a church profaned. Originally built by Saint Clotilda to receive the bones of Saint Germain, the church was rebuilt in 1270, completed in the fifteenth century, partially wrecked by the Huguenots, further demolished in 1820, and finally, being reduced to a choir and transepts and a disjunct tower, was desecrated and its surrounding buildings were appropriated to the purposes of a school and hospital.

It is from the river side, or from beyond the river, that the best view of the churches is obtained. Seen from thence, the towers rise in a mighty range above the tall warehouses of the quay. Above the green trees of the Préfecture, once the Episcopal Palace, above



North Transept: Sens Cathedral.

the ruddy roofs and chimneys of the houses — majestic among them all — advances the apse of the Cathedral, whose *chevet* rides forward like the blunt prow of some warship. Three towers are there, too,

besides those I have named — the belfry of Saint Pierre, which dates from the sixteenth century, the traditional spire of St. Eusèbe, and the fantastic "Tour Gaillarde," crowned by a timber *flèche*, and accompanied by an arch which picturesquely spans the narrow street. St. Eusèbe, which stands at the top of the hill, is a church

whose interior is marred by excess of tidiness. Like our Worcester Cathedral, it almost smells of the dustpan and brush; there cannot be a cobweb in the highest nook of the clerestory, and it is trimly fitted with gas-brackets that might have come from the British Midlands. For all that, it is a noble church, especially in outward show, and there is a curious Classic touch laid upon its square buttresses which is one of the local traits that I should like to emphasize. It would almost seem as if that Jean Chéreau, of Joigny, who so delicately laid the hand of the Renaissance upon the Gothic work

at Villeneuve, had been here also — at all events, there was a spirit abroad in this district which saw how beautiful among the roundness of Gothic forms could be the squareness of the Classic.

This is well though quaintly exemplified in the little half-ruined church of St. Julien-le-Sault, which I have mentioned before as lying on the way from Sens to Auxerre. In it the architect, of what date I know not, wove the essence of pilasters into the more normal clustered shafts of his nave-piers, and the effect of the flat faces and keen arrises among the customary curves and hollows is refreshing even if wicked. Each of the flying-buttresses at St. Eusèbe, to return to the Auxerre church, seems to rise out of its Gothic surroundings with a sort of protest, saying, "I am by nature a tall and square thing, and if I feel happier and look well with a bit of Classic cornice-mould around my top, who are you to say that I ought to be ashamed of myself?"

Auxerre, you will see, is a city to make a free-thinking architect happy, and to set another to free thinking. Indeed, one might happily spend many a day there, but the time is short, and there is a building calling for our homage — the Abbey Church of Pontigny.

If a man should dream, in a holy dream, of a perfect Cistercian abbey in a perfect place, would not his vision, free of choice, choose some stream-watered valley between moderate hills? Would not those hills flourish with vines on their southward slopes and with pleasant pastures on the cooler sides? Would not the valley itself, broad and fertile, smile with sunlit wood and golden corn-land, and the abbey, would it not be founded aloof from homes of men in the very midst of some "field which the Lord hath blest," so that the wind-swept wheat should shudder like a sea round the headland of its apse? And what of the building as it grew? When first the plan's outline

had marked, as in blessing, the Cross upon the already blessed earth, should not the walls rise in a graceful simplicity as chaste as the dress of a nun? Should not the buttresses be clean and unadorned, fashioned direct for their work, equipped like a neat human limb for the express purpose of their being? Should not the walls be stout and unadorned? Should not the windows be exact in their function

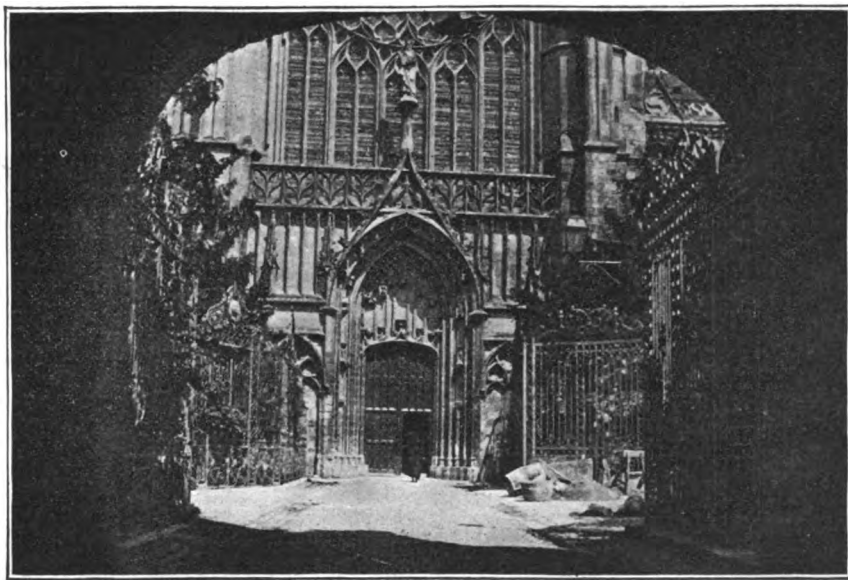
without unnecessary curve or cusp, without hindrance of transom or mullion, without wantonness of shape, without allurements, other than the winning allurements of sheer aptitude? Should not the roof of this dream-church be plain outwardly as the roof of any simple farmstead, exelling only by its visible length and strength

and its invisible dedication? Inwardly, should not its massive vaulting spring in the lightness of ponderous strength from piers straight in their purpose, apt in their pose and in their adornment simple as the prose of a prayer? And should not the dreamer in his dream place his monastic buildings hard against the forecourt which fronts the plain narthex of the church, so that the transept-door on the cool north side shall show, when open, the sunlit green of the monks' still garden and the hazel walk from church to stream, on whose gray gravel the sentinel tread of silent readers has already worn the track of walking meditation.

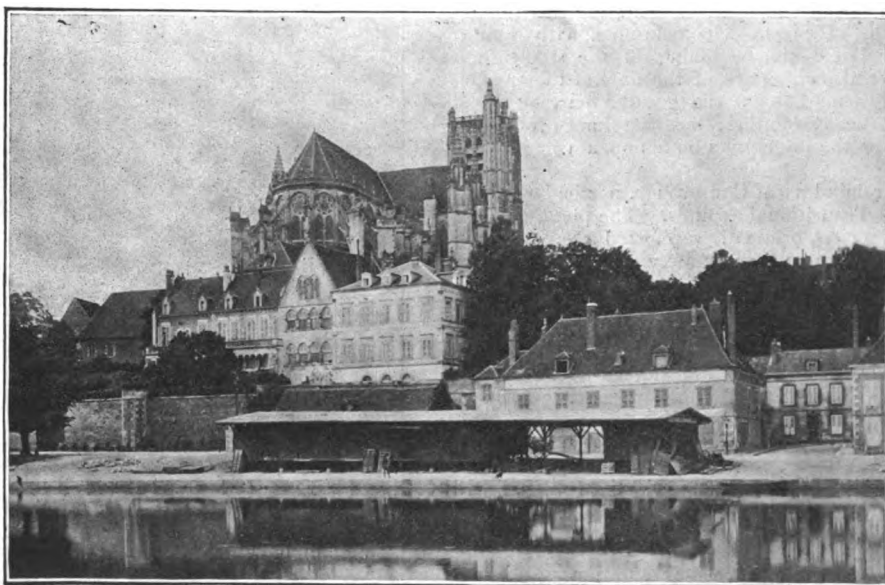
The dreamer, if he dreamed thus, would surely dream aright, and if he should awake in the warm valley of Pontigny at the edge of a little oak wood, busy with nightingales and with the rustle of stream and wind, he would rub his waking eyes, not on the disappointment of a hope unachieved, but on the glowing, incredible reality of the great Abbey Church that sheltered the exile of two archbishops of Canterbury, and to this day holds the honored bones of a third. He would see before him the great radiant apse riding like a ship in the wavy corn-land and surmounted by that plain, red, towerless roof, which to an eye in the heavens must look like a sanguine cross on the verdant earth.

Pontigny, to common travellers, is approachable by a steam-tramway from La Roche; but as La Roche is little more than a nineteenth-century railway-junction, it would seem better to most folk who have sufficient poetry in them to love the place aright to approach it, not by any such prosaic means, but by driving from Auxerre. From Auxerre you have before you some twelve miles of white road, lined with alternating copse and vineyard, before, at the crown of a gentle hill, you have in front of you the unexpected aspect of what you have come forth to see. There stands the church extended to its greatest length — unyielding in its simplicity, uncompromising in its quiet Christian might. It is lost again as you descend to the small village, out of which a straight avenue leads to a Renaissance doorway, in whose arch the abbey stands framed in a new aspect. A minute belfry is all that breaks the bare anatomy of the outline. A gable that fits the roof — a window flanked by two blind arches, which, though without function, are no more than comeliness demands, an almost shed-like narthex and an open, welcoming portal: such are the simple factors out of which is made one of the happiest fronts that ever decked a church. To this,

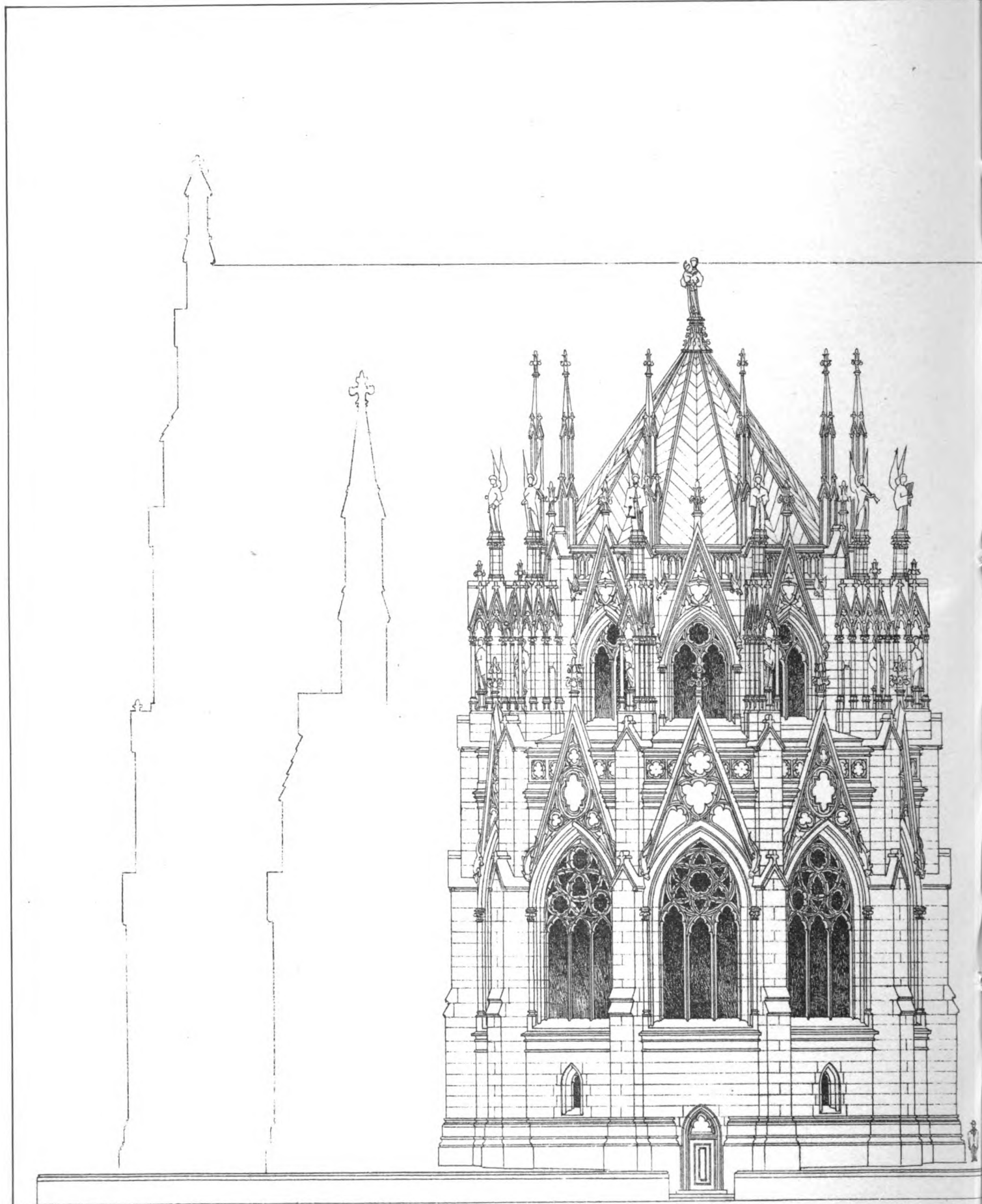
Nature, with the guidance of a little human garden-worship, has added the grace of an avenue of young limes and the hospitality of greensward. Half-way between portal and church stand gateposts and grilles on the right hand and on the left, indications not so much of later interference as of the continuance in the sixteenth or some later century of the devotion that did its work



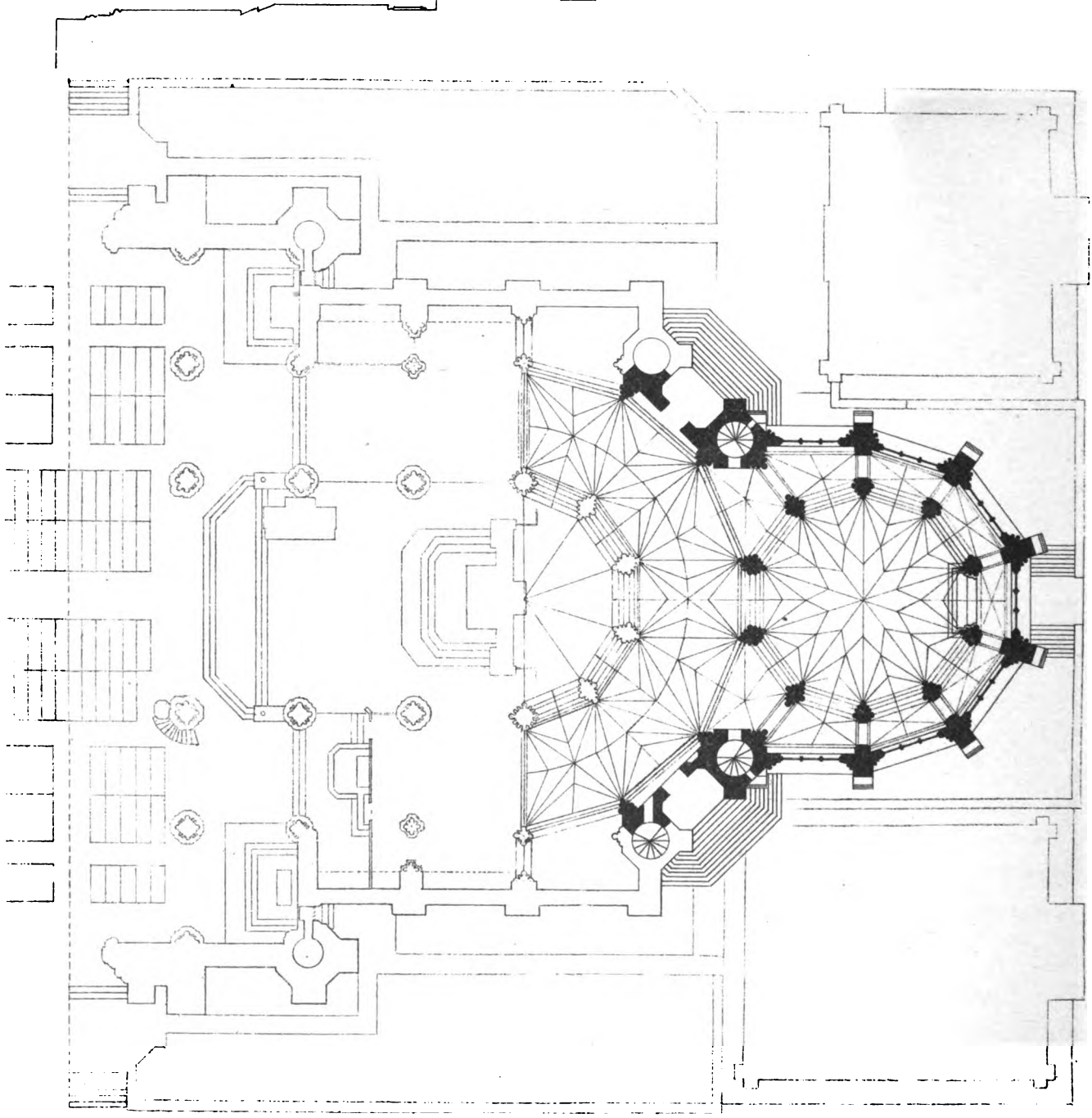
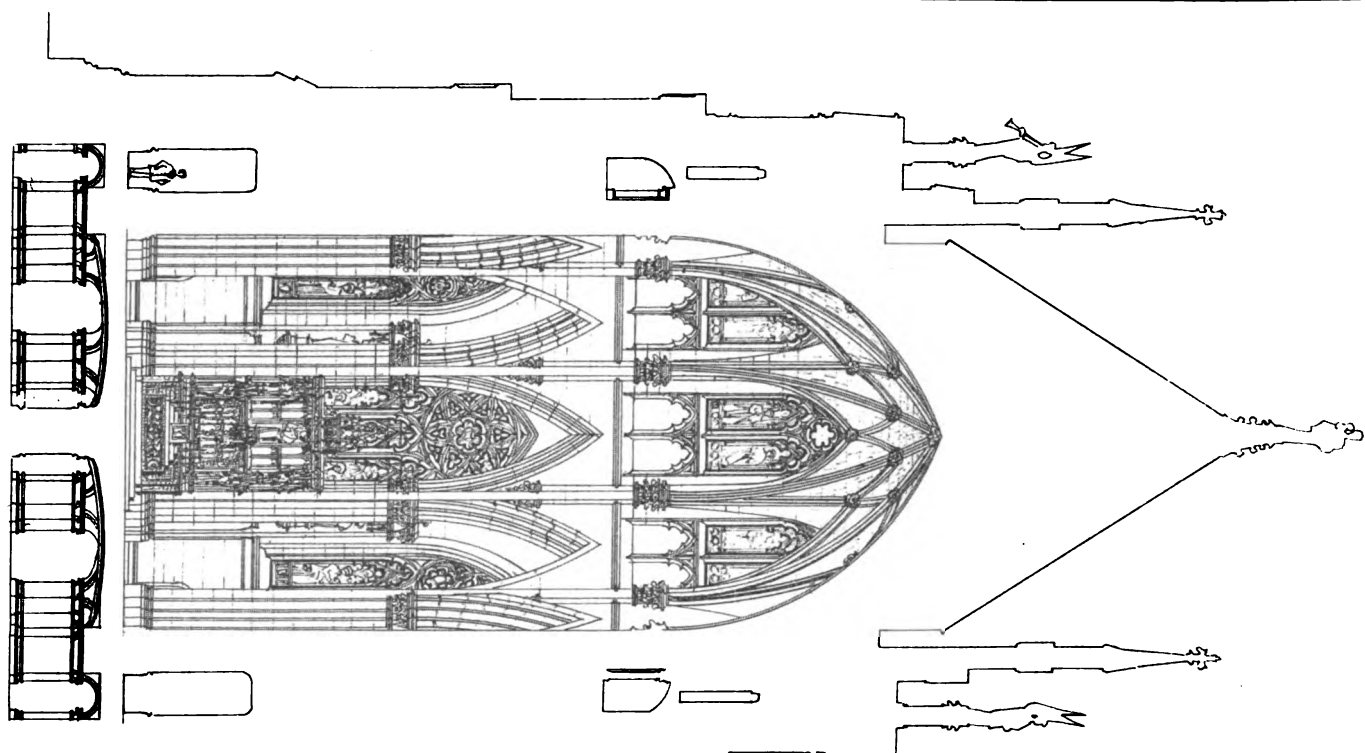
South Transept Porch: Sens Cathedral.



Auxerre Cathedral, seen from the River Yonne.

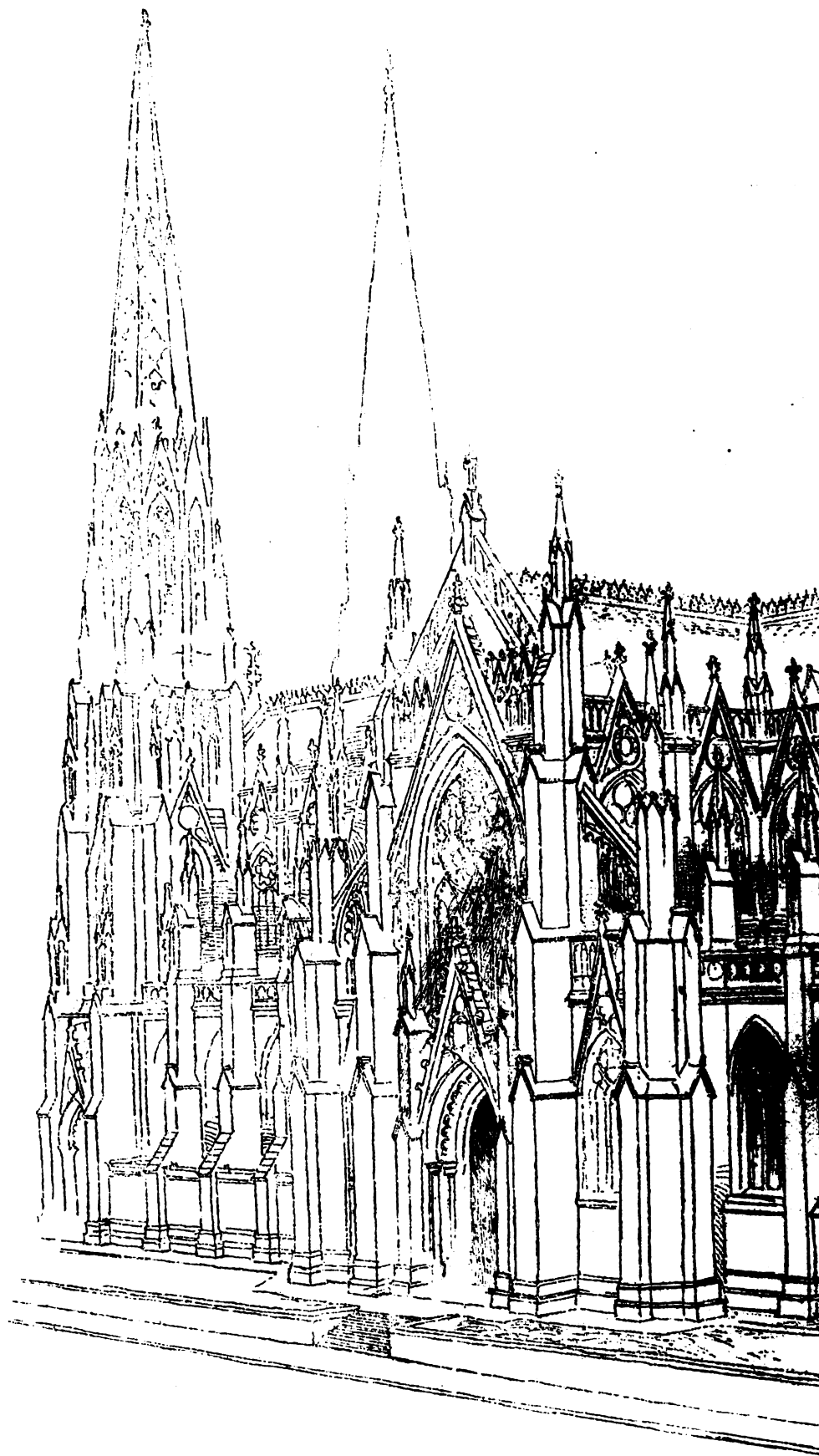


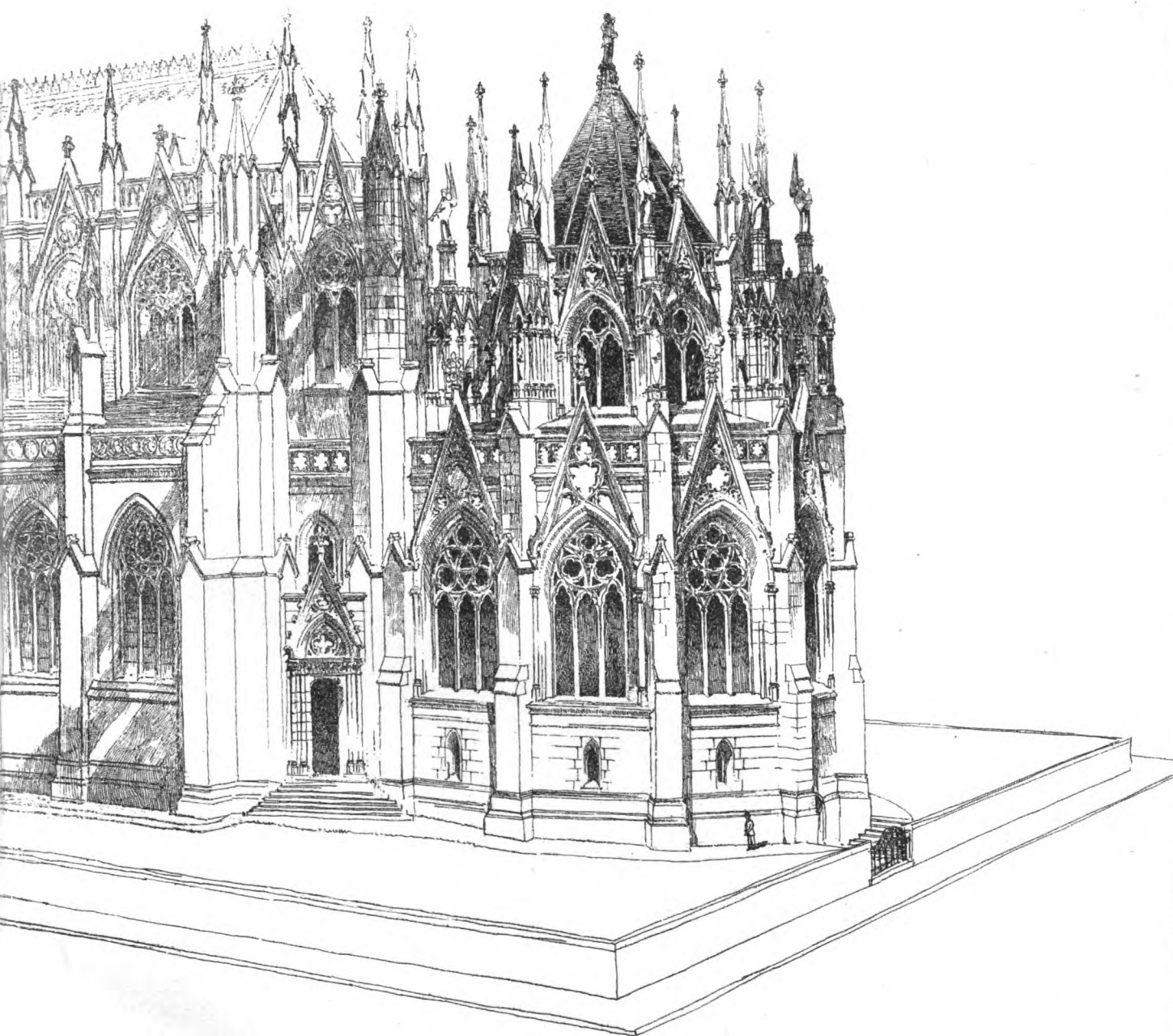
• ELEVATION • OF • EASTERN • END •



A COMPETITIVE DESIGN FOR THE LADY CHAPEL OF ST. PATRICK'S CATHEDRAL, NEW YORK, N. Y.
 RENWICK, ASPINWALL & OWEN, ARCHITECTS.

WATERMAN PAPER CO. NEW YORK



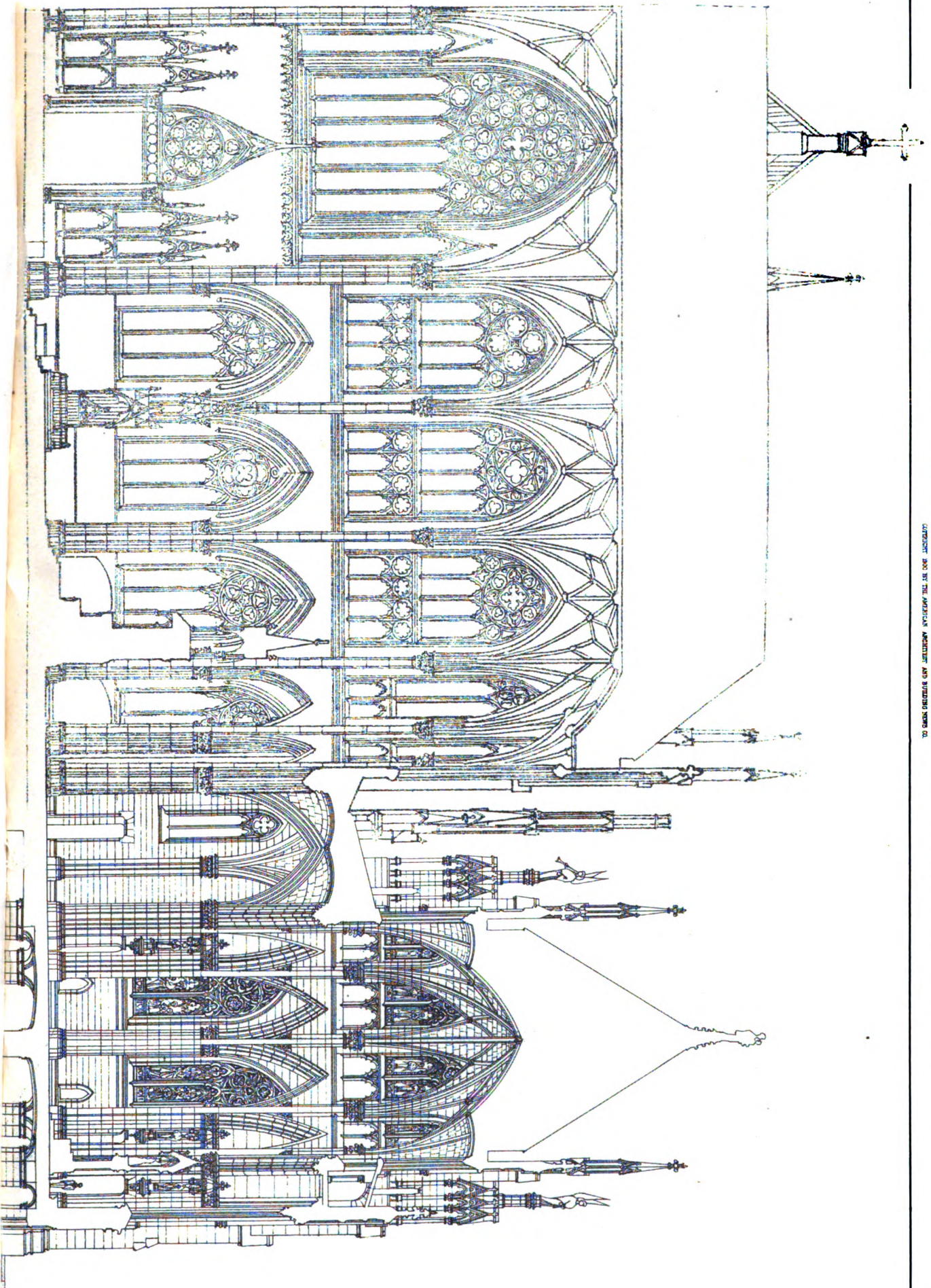


ST. PATRICK'S CATHEDRAL, NEW YORK, N. Y.
OWEN, ARCHITECTS.

MERRIGAN ARCHITECT AND BUILDING DEWS. SEPT. 8, 1900.

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• SECTION • LOOKING • WEST •

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in the twelfth. The abbey buildings, shrunken and changed, and inhabited now by a mere apology for a monastic community, lie with their garden on the left, or north side; on the south is a small cemetery, rendered trumpery by the horrid emblems which stand for mourning in modern France, while all around the east end lie the wide farmlands, without any boundaries save the change from one crop to another. So simple is the church that the fancies of my imaginary dreamer and the pictures here shown will tell all I can tell. Its message is one more of sentiment than of facts. A *résumé* of its architecture, stone by stone, in guide-book fashion would give less idea of its effect than can be got from the few words, which many must be familiar with, in the late Walter Pater's article on Vézelay.

If you had been there with me when, on a hot June noon, two hot priests brought in a score of school-children, who shouted rather than sang a song of honor to St. Edmund, you would have realized more than pen can write of the sermon in stone which a great and ancient church has to tell, a story of the strength and weakness, the constancy and, alas, the inconstancy of a great religion. Pontigny would make an infidel pray and a believer think.

The narthex, to drop into stony facts after all, is in this district a common feature. Experts are divided as to its intention. It may have been a place for those whose churchmanship was limited — for catechumens, for the unbaptized, or for women. It is certain that in the days of pilgrimage these places were used not merely for places of rest, but even as lodgings for pilgrims. They are of various types, some are outside the church doors, as here at Pontigny — some are within, as at Vézelay — all are beautiful adjuncts to the church and have a function in sentiment, if not in practice — a halt between the sacred and the profane.

From the rural holiness of Auxerre, it is an abrupt change to the rather earthly bustle of Dijon; but Dijon, for travellers' reasons, is the best place for the next stage. Do not fear that I shall quote you ten pages of guide-book on that comparatively well-known town. Its contrast with the simplicity of the other towns and hamlets we are among is so sharp that one is tempted to shorten one's stay in its busy streets — its shops, where English is spoken, and its hotels, where English travellers are expected to unload their traditional wealth. Though we must spend a night there, it will be enough to visit the "Puits de Moïse," a glorious relic of fourteenth-century sculpture by one Claus Schluyter (a Fleming), whose richness seems to belong to a later date, and the churches of St. Bénigne and Notre Dame. The former is more interesting than beautiful, and that of Notre Dame, in itself a dull fabric, has a narthex



The Nave: Auxerre Cathedral.

which, though far from dull, is not exactly pleasing. This narthex is immensely tall — taller than the church and with no relation to it in shape — except what one might call a strained relation. It is an appendix or, rather, façade, made up of superimposed arcades, and it dates, like the church itself, from the thirteenth century, and

rather suffers from being only visible in sharp side perspective. It fairly bristles with gargoyles, and, though very rich, is rather to be dreaded as a proof that even the blessed thirteenth century sometimes substituted quantity for quality, intricacy for beauty, and fuss for design. You might call it "jolly" rather than beautiful.



West Front of the Church, Villeneuve.

St. Bénigne takes a special interest from its possible connection with the Comacine masons, whose claims have recently been so hardly set forth¹ by the lady who writes as "Leader Scott."

PAUL WATERHOUSE.

[To be continued.]

THE FIFTH INTERNATIONAL CONGRESS OF ARCHITECTS.

PARIS, August 10, 1900.

THE Congress was held in the beautiful Hémicycle of the École des Beaux-Arts from July 30th to August 4th. Seven hundred architects from all parts of the world had subscribed. Of these about half were present, nine being Americans.

The Official Delegates from our country were Mr. Van Brunt, of Kansas City, also Delegate A. I. A.; Mr. Jenney, of Chicago, Delegate A. I. A.; Mr. Hornblower, of Washington, Delegate Washington Chapter, A. I. A.; Mrs. F. Fuller, of Chicago; Mr. Totten, of Washington.

Mr. Van Brunt was chosen Vice-President of Honor, but not being present, Mr. Jenney acted in his place. Mr. Totten was the Honorary Secretary. The other Americans present were: Mr. Glenn Brown, of Washington; Mr. Stead, of Washington; Mr. Van Pelt, Delegate Central N. Y. Chapter, A. I. A.; Mr. Itner, Delegate St. Louis Chapter, A. I. A.; Professor Clark, of Boston; Mr. Sanders, of San Francisco.

The President of the Congress was M. Alfred Normand, M. Pupinel being the Secretary.

The subjects discussed during the sessions of the Congress were: I. *Artistic Ownership of Works of Architecture*. — Two papers were read upon this subject and a general discussion followed, resulting in the following resolutions or conclusions: —

"That the same protection should be given works of architecture as to those of painting, sculpture and other works of design.

"Considering the works of architecture to include the plans, sections, elevations, details (exterior and interior), decorative and other details in general, constituting the works of the architect, of which the constructed edifice is only the reproduction.

"Considering the works of architecture to have the same right to protection by law as painting or sculpture . . . when original or individual."

We have some laws upon the copyright of design, but they are not

¹"The Cathedral Builders," by Leader Scott.

what they ought to be, and it would seem as though this were a subject to be considered by the Institute.

II. *Architectural Instruction.*—This subject was continued from the last Congress. M. J. J. Pillet, of the Ecole des Beaux-Arts, opened the discussion by a most ingenious and interesting paper. He assumed that a great nation of 40,000,000 people desired to organize a complete national architectural educational system. He began with the study of the nation and reviewed the possible intellectual and artistic resources, and then proposed schools of various grades, from the most elementary to those of the highest.

"The Practice of the Profession, Architectural Societies, Building-regulations," and so forth, was altogether a most admirable and inspiring paper, well worthy of being published in book-form.

This was followed by a paper on "The Artistic Movement during the Last Ten Years," by Prof. Otzen, of the Royal Academy of Arts, Berlin, in which he points out what the aims of the architect should be. . . . He should have principles to follow, and not abandon himself to the current of professional practice.

Then came a paper by Mrs. F. Fuller on "Woman and Architecture," following somewhat the same strain, but showing that the profession of architecture was legitimately open to women. In fact, going so far as to assert that the pre-historic architect was a woman. Certainly a paper of great interest to the female members of the profession.

III. *The Title of Architect in Different Countries.*—Discussion upon this subject developed the fact that while legislation was pending in many parts of the world, the only two states or countries in which a diploma or license for the practice of architecture was necessary were Portugal and the State of Illinois.

In connection with this, the Société des Architectes diplômés par le Gouvernement presented the following resolution:—

"It is desirable to create a diploma of architecture, but it is undesirable that it should be obligatory, as inflexible rules are bad. It would be objectionable to create a partial diploma, the value of the diploma depending upon the ability of the one upon whom it is conferred."

The following resolution was passed by the Congress:—

"That the various Governments should take measures to protect and to cause to be respected the title of architect; reserving it in the future, without retroactive effect, for architects provided with a certificate, diploma or license (*Brevet de capacité*), forbidding others to employ this title, but placing it within the reach of all, by the diffusion of architectural instruction."

IV. *Cheap Habitations in all Countries.*—A subject introduced by English architects, but discussed too much in detail to be given here. I may add, however, that the attention of the Congress was called to the work done by the Tenement-house Society of New York and to their admirable exhibition of models in the Exposition.

The subject of "Skeleton-frame Construction," introduced by Mr. Jenney and myself, was put under this head. Mr. Jenney's very able paper was read by Professor Pillet, who, I may add, by way of parenthesis, was in Chicago in 1893, and is taking a most lively interest in the matter. A paper on the artistic treatment of skyscrapers (*grattoirs du ciel*), by Prof. A. D. F. Hamlin, was most enthusiastically received. This I illustrated by lantern-slides. The Fuller Company invited the Congress to the Exposition to see their models of the skeleton-frame, the exterior and details, of the "Broadway Chambers"—a most creditable exhibit.

V. *The Preservation of Historic Monuments.*—The principal paper upon this subject was by Mr. Alfred Bohnstedt, of Minden. He began by citing resolutions passed at the Brussels Congress in 1897, "That a complete inventory be taken in all countries of all historic monuments, works of art therein contained, as well as discoveries by excavation." Among other things he said, "The strongest means of protecting historic monuments is, without doubt, by public opinion," and he cited some of the Belgian cities, which were not contented simply with the preservation of the monument itself, but preserve intact, as far as possible, the surroundings as well.

The Congress expressed the desire that place should be made in architectural schools of all grades for the study, even if brief, of the monuments of the past, and of the means of guarding against their destruction, leaving the care of their preservation or of their restoration, if there is occasion, and of the works necessary for this, to special commissions; and that if the restoration is entrusted to a commission, the artistic responsibility must rest absolutely with the expert to whom this commission confides the restoration.

In this connection, should not we American architects take greater measures by governmental and municipal legislation to better preserve what historic works remain to us from the Colonial Period. To be sure, our historical societies are doing a great deal of valuable work in this direction, but should not the restoration and preservation be confided to architects, as are the historic monuments in France?

VI. *The Influence of Building Regulations upon Contemporary Private Architecture.*—I regret to say that this subject was postponed until the next meeting of the Congress. Few people except architects realize what an enormous influence building regulations have upon the architecture of a city. The discussion of this subject will leave something of speculative interest for the future.

The final resolutions of the Congress were as follows:—

"That the Official Delegates of the different countries represented convey to their respective Governments the conclusions of the Congress.

"That the Sixth International Congress of Architects be held in the city of Madrid in the spring of 1903."

The usual architectural exhibition was held in connection with the Congress. It included some very interesting sketches and drawings by Charles Garnier, Viollet-le-Duc, and others.

In addition to the serious discussions of the Congress, several excursions were made to historic spots. One afternoon, we spent at Chantilly, another in inspecting the new Gare d'Orléans, etc.

Receptions were the order of the evenings. The opening one was held in the Salle des Fêtes of the new Gare d'Orléans. A grand reception was tendered our Congress by President Loubet, but the crowning social feature was to have been the ball at the Hôtel de Ville. Invitations to this, however, had to be recalled, owing to the unfortunate death of the King of Italy.

Now that the Congress is over, it might perhaps be worth while to speculate on the real value of an International Congress. The cost is not inconsiderable, some 15,000 francs and an enormous amount of labor on the part of the organizers. What is to be gained by it? Its main objects, of course, are social intercourse and the advancement of the profession, in its broadest sense. Does it accomplish these ends? Certainly the first, that of social intercourse, is well fulfilled, and it is most agreeable, indeed a great pleasure, to meet men of one's own profession of other countries.

The second consideration, that of advancement of the profession, would mean individual advancement of the members participating, and advancement to the profession at large. There can be no doubt, it seems to me, in the personal good to be gained by the discussions—the great drawback, however, in an International Congress is that of language, for no matter which one is the official medium, it will still be foreign to a large number of the members. If any advancement to the profession at large is to be gained from the discussions, it will largely rest with the individuals and their respective societies to realize these conclusions, or, at least, to make them known where they are the most needed. To illustrate what I mean, I will cite an example, begging your indulgence for its personality.

At the last Congress held in Brussels in 1897, I read a paper on "Methods for obtaining Designs for Government Buildings," a vote was taken upon this subject, which was in favor of public or private competition. This vote was brought to the attention of our Government officials, and I am told had considerable weight in deciding them to try the experiment. I cite this example as being of practical value to our own country. The good the Congress has accomplished for the countries of Europe is very considerable.

The detailed proceedings of the Congress will be published in a few months in the "*Compte rendu*," parts of which I trust you will print in the *American Architect*. G. O. TOTTON, JR.



[Contributors of drawings are requested to send also plans and a full and adequate description of the buildings, including a statement of cost.]

A COMPETITIVE DESIGN FOR THE LADY CHAPEL OF THE CATHEDRAL OF ST. PATRICK, NEW YORK, N. Y. MESSRS. RENWICK, ASPINWALL & OWEN, ARCHITECTS, NEW YORK, N. Y.

THIS design has all the more interest that it issues from the office of the architect of the Cathedral building itself, and so may be held to be very nearly what the late Mr. Renwick himself would have liked to see added to his original design.

PLAN AND SECTIONS OF THE SAME: TWO PLATES.

[The following named illustrations may be found by reference to our advertising pages.]

PETIT PALAIS DES BEAUX-ARTS, PARIS, FRANCE: TWO PLATES. M. GIRAULT, ARCHITECT.

THESE plates are copied from *La Construction Moderne*.

[Additional Illustrations in the International Edition.]

OFFICES OF THE PRUDENTIAL INSURANCE CO. OF AMERICA, NEWARK, N. J. MR. GEORGE B. POST, ARCHITECT, NEW YORK, N. Y.

CISTERCIAN ABBEY CHURCH, PONTIGNY, NORMANDY, FRANCE.

FOR description see article "A Corner of Old France" elsewhere in this issue.

PROPOSED FAIRMOUNT PARK EXTENSION, PHILADELPHIA, PA.: BIRD'S-EYE VIEW. MESSRS. SCHERMERHORN & REINHOLD, ARCHITECTS, PHILADELPHIA, PA.

RECENTLY, efforts have been made in Philadelphia towards securing the Fairmount Park Extension, or Boulevard. Heretofore, the one great difficulty in the way of accomplishing the boulevard project has been the great expense, but the plan here illustrated removes all such claims.

Ex-Select Councilman William G. Huey of the Fifteenth Ward has been a foremost advocate of some step in this direction, and he has, time and time again, contended that any expense to which the city might go on the proposed line will be more than overcome by the increased valuation of the property in the immediate neighborhood of such improvements. In 1899, he retained Schermerhorn & Reinhold, architects, to devise a plan for a concourse extending from a point near the centre of the city to the Green-Street entrance of Fairmount Park. It is contended that in arranging this particular plan, the architects were governed by two desires: first, to select a locality which might be best adapted for the development of the scheme, and, second, to confine the expenditures to the lowest possible figure.

The plan provides for a concourse 275 feet in width from the north side of Carlton Street, the first small thoroughfare north of Wood, to the south side of Pearl, the first small thoroughfare south of Wood, and in length from Broad and Wood Streets to the Green-Street entrance of the Park. Beginning at Broad Street, what is now known as Wood Street would form the central roadway of the concourse, having on either side, sidewalks, wide lawns and bicycle-path, the latter to occupy the roadbeds of Pearl and Carlton Streets. In this form the proposed concourse would extend in a straight line to a point just west of Twenty-first Street, where it would curve gradually to the north, and cross Spring Garden Street between Twenty-second and Twenty-fourth Streets. From this point the plan provides that the land within the triangle bounded on the south by Spring Garden, on the west by Twenty-fifth Street, and on the south-east by Pennsylvania Avenue, shall be included at the western end.

The total length of the concourse is about 5,000 feet, and it is asserted that the entire cost of putting the project through to completion will be less than \$3,000,000, while the old plan of the boulevard with a width of but 150 feet, extending, as the crow flies, from Broad and Filbert Streets to the Green-Street entrance, would require an expenditure of at least \$25,000,000. The property in the section through which the concourse would run is nearly all of a ramshackle character, and at present it is practically an abandoned district. The proposed road would reclaim the entire neighborhood and increase the value of the land to such an extent that the old buildings would give way, the slums disappear, and in their places arise handsome dwellings and orderly surroundings. To give some idea of the probable result of the movement, the friends of the project say that it is only necessary to compare the present values on the line of the proposed concourse to those on Chestnut Street. The former is placed from \$50 to \$350 per foot front and property on Chestnut Street is selling at \$1,000 to \$7,500 per foot front. It must be admitted, say the advocates of the plan, that if the concourse plan is finally adopted, values in the surrounding territory must advance at least \$5,000,000, and at the present tax-rate the city would receive annually an additional revenue of more than \$150,000, or more than it would cost the city to complete the improvement, estimating that the city would do the work at about 3 per cent on the amount named, or about \$90,000 per annum.

Thus it can be readily seen that the city could carry out this vast improvement at a cost which would not greatly be felt by the taxpayers.

SELECTED DESIGN FOR THE NEW SESSIONS HOUSE, OLD BAILEY, LONDON, ENG. MR. E. W. MOUNTFORD, ARCHITECT.

INTERIOR OF HALL IN THE SAME BUILDING.

A CORRECTION.—In the title of the illustration published last week of the house on East Fifty-fourth Street, New York, two blunders were made: First, the house is that of Mrs., not Mr., Young, and, second, to the name of Mr. Hiss should have been added that of his partner, Mr. Weekes, as the architects.



[The editors cannot pay attention to demands of correspondents who forget to give their names and addresses as guaranty of good faith; nor do they hold themselves responsible for opinions expressed by their correspondents.]

THE PARIS AND CHICAGO EXHIBITION BUILDINGS.

THE Exposition as a spectacle is disappointing. It looks better in the photograph than in the reality. The opportunity for anything like our Court of Honor at Chicago was, of course, lacking, and it is very gratifying to realize in the face of all the crudity in America

which one's first visit to France reveals that we had the inspiration to turn a swamp on Lake Michigan to the purpose we did. There was so much French criticism of the fair that it is a relief to find that those critics were demanding of us the impossible—that the fair was more nearly what we thought it ourselves. The French have here an opportunity—with, of course, very serious limitations of site—of showing how the thing should be done; it is clever, it is original, it is everything but pleasing.

To this, of course, there are certain exceptions. The Grand and Petit Palais are wonderfully good. The detail of the Petit Palais is perhaps a trifle too fanciful for the permanent building it is, and in certain features the detail lacks proper emphasis; but it is—barring the somewhat absurd and illogical interior court—a building very creditable to its country.

The Grand Palais, as far as the stone and stone details go, is all that could be desired. Behind the long colonnades are admirable terra-cotta panels—a permanent form of exterior painting, so to speak. The concave corners are ingenious rather than successful, and the slightly curved façades at the sides are also weak. But the roof—it is of iron and glass—comes down upon the stone, and that is about all. It is not sufficiently decorated, and exhibits the very fault the French criticised at Chicago. They said that our buildings there showed no proper relation between steel roof and substructure. Here in a building, not of staff, but stone, the same thing shows, and, to my mind, more glaringly; it would seem to prove that a criticism which rankled then was in reality somewhat unreasonable. There may be a solution, but it is not here.

On the interior, the structural iron has been decorated in the most ingenious and successful way, and, in spite of the novelty, it is almost beautiful.

There is also a greater and a lesser court in the Fair in which everywhere the detail is of about the same character. The architects seem to have considered the Exposition as a sort of fairyland, and to have used the detail appropriate to the fantastic architecture of the settings of the ballet. But in using it it was necessary to magnify it, until from being fanciful it became monstrous. The fairies, after all, are a little people, and Titania rode in a walnut-shell behind grasshoppers hitched with spider-web. Here a fitting Titania would be forty feet high and drive dragons or ride a hippogriff. In consequence, the effect of it all is fantasy gone over to madness; one is oppressed and haunted by these misshapen forms, which on a smaller scale only would be pleasing. After all, the Chicago idea of free Classic, a temporary Olympus for the gods and demi-gods, or, rather, the Latin Olympus, wherever that was—rather than this abode of overgrown fairies, seems far more fitting, more restful and more beautiful.

This letter has grown longer than I intended, but I hope you will not think that I have done it merely to allow the eagle to scream. The comparison between our own recent fair and this is too natural to be avoided. In matters of detail, in all that results from mere training, the architects of this fair are in general ahead of us, but in more important matters we have reason to be proud of our work.

The great entrance is as bad as it is supposed to be. Its plan is as absurd as its crowning figure of "Paris." It looks rather like the gateway of a high-class Coney Island—though a trifle bigger. As a piece of coloring, it is beautiful in its greens and blues and gold; as a study and adaptation of Assyrian ornament, it is surprisingly clever; as a whole, it is a mistake.

This letter might go on indefinitely—the French pictures alone deserve reams—but I will close.—*Extract from a private letter.*



FELLING A TREE BY ELECTRICITY.—One of the chief attractions of Jacksonville, Ill., is the large trees which overarch many of the principal streets, shielding them from the sun. The grounds of the State Insane Hospital, located there, are also shaded with many trees, and recently a limb of one of the largest of the trees was broken off by the wind. As it fell it blocked the carriage-drive, and it was decided to cut away the whole tree. As the workmen found the tree too large for a crosscut saw, they were about to chop it down, when it was suggested that the electrician "electrocute" it. Following out the suggestion, connection was made with an arc-lamp circuit passing near. The electrician changed the circuit at the power-house so it could be thrown on to a dynamo that was operating a power circuit, and then dropped a couple of short wires from the nearest arc-lamp pole, connecting 20 feet of No. 14 iron wire between them. Putting the wire around the tree and having a couple of men hold it taut, the current was turned on, but it was found that only a 35-ampere circuit could be obtained. This was not sufficient to make any appreciable effect on the trunk of the tree. After another unsuccessful attempt with a smaller iron wire the arc-light circuit had to be put in service for the night. The following morning a pair of No. 2 weatherproof lines were run to the nearest underground feeder, and a 20-foot piece of 7-strand No. 16 galvanized-iron wire was inserted in the circuit, three of the strands being taken out to give air-space and room for the products of combustion to pass. The feeder was cut out of regular duty and put on a small dynamo, which was also specially arranged for a wide regulation of voltage. The dynamo-tender was given a code of signals and told to keep his eye on a man who was placed on top of the Administration Building tower to transmit the signals from the electrician. Soon after a signal was passed the wire became uncomfortable to the touch; another signal and it soon began to smoke and the bark to blacken; another,

and the zinc whitened, while those holding the cautery began sliding it slowly back and forth. The bark sparked and smoked. The wire took a dull red color in the sunlight and a cherry hue in the crevice. Its motion was adjusted so as to give sufficient air to reduce the wood to soft charcoal after the water was evaporated, and to remove the charcoal as fast as formed. In an hour the crevice was 18 inches deep, and at this point the wire, having been considerably reduced in size by oxidation, gave way, and was replaced by another. The operation was kept up until the trunk was almost cut through, when the little bit of unburned wood in the centre of the trunk parted and the tree fell. The tree was an elm, with a large percentage of water, and was 11 feet in circumference. The current in the cautery was from 120 to 135 amperes direct, the voltage at the machine being varied from 80 to 115. The time consumed in the operation was two hours and ten minutes. — *Western Electrician*.

LONDON'S NEW CATHOLIC CATHEDRAL. — The building of this vast and stately cathedral, undoubtedly the largest built in Great Britain since the Reformation, originated with Cardinal Manning. After 19 years of strenuous effort the present site in Ashley Gardens, Victoria Street, was secured for the purpose of its erection. Further than this, the late Cardinal was unable to proceed with the undertaking. In 1894 Cardinal Vaughan resolved to begin the erection of the cathedral. With Westminster Abbey within sight, the idea of a cathedral of Gothic style of the magnitude contemplated was not to be entertained. The style decided upon was the Early Byzantine. John Francis Bentley was the architect chosen. The plans accepted, and since carried out, embraced a noble porch, a narthex, or vestibule, a campanile, a nave and two aisles, with transepts; a baptistery and eight side chapels; a sanctuary $4\frac{1}{2}$ feet above the level of the nave, having on one side a spacious chapel of the Blessed Sacrament, and on the other side the Lady Chapel; beyond the sanctuary an apsidal choir, raised 18 feet above the nave, for the chanting of the divine office, with a crypt chapel beneath it; over the aisles and at the west end capacious tribunes, or galleries, and behind the Blessed Sacrament Chapel 2 large sacristies and rooms connected with them. The external dimensions are: Extreme length, 360 feet; width, 156 feet; height of nave, 117 feet; height of façade (not including the turrets), 101 feet; height of campanile, 273 feet, and to the top of the cross, 283 feet. Internally the dimensions are: Length from the main entrance to the sanctuary, 232 feet; depth of the sanctuary, 62 feet, and of the raised choir beyond, 48 feet, making the total internal length 342 feet; width of nave, 60 feet; width across nave and aisles, 98 feet; across nave and aisles and side-chapels, 148 feet; height of the main arches of the nave, 90 feet, and of its three domes, 112 feet. The chief structural materials used are very hard brick and stone set in cement-mortar. The external walls, to the height of 8 feet from the ground, are of granite, and the structure above of red brick, in many parts artistically arranged, with a large amount of decorative work in Portland-stone. Internally, besides the lofty and massive piers, there will be 28 columns of marble 17 feet high in the nave, aisles and transepts, as well as many other columns of marble and granite in the sanctuary, the crypt and other parts. It is also intended to cover the lower walls and the piers to the height of 38 feet with marble. The whole of the upper part of the piers and walls and the vaults and concrete domes will be decorated with mosaic work illustrating the history of the Catholic Church. The cost of the cathedral building — that is, of the fabric simply, without the internal decoration — will probably exceed £170,000. It is impossible, at this date, to form any estimate whatsoever of what the decoration and ornamentation of the interior will amount to. The opening of the cathedral is announced for June 29, 1901, the Feast of the Apostles SS. Peter and Paul, the sixth anniversary of the solemn laying of the foundation-stone. — *From the Pall Mall Gazette*.

PURE AIR IN HEATED DWELLING-ROOMS. — "When a coal-fire is in use for heating and the electric-light for lighting an inhabited room, the air is purer than by any of the other plans tried for heating and lighting." Such is, perhaps, the most important conclusion arrived at in an interesting investigation on this subject by Mr. Francis Jones. Mr. Jones's investigation has led to other observations which are not less in point of interest as bearing upon the question of the healthy condition of domestic apartments. He finds, for instance, that the air of a room, however heated and lighted, is purest at the floor, less pure three feet above, and most impure at the ceiling, and that when a gas-fire is in use for heating and the electric-light for lighting, the amount of carbon-dioxide in the room rises rapidly in the first two or three hours and then remains uniform for three or four hours afterward. When a coal-fire is in use and an ordinary gas-jet is burning, the air of the room is purer than when a gas-fire is in use and an ordinary gas-jet burning. The use of a gas cooking-stove with a flue connected with the chimney greatly raises the amount of carbon-dioxide in the air of the room. The humidity of the air of the room is much diminished by the use of gas-fires. — *London Lancet*.

A UNIQUE BELL-TOWER. — When the first settlement was made on Commencement Bay, Puget Sound, it was simply a lumber-camp and trading-post. After the Northern Pacific Railroad was completed to Commencement Bay, a city was built on the high ground above the lumber-camp southward, and that is the handsome city of Tacoma, Wash. The ancient lumber-camp is now that part of Tacoma which is called "Old Town" locally. Early in the history of Old Town an Episcopal clergyman, now Bishop Morris of Oregon, built a little wooden church in the place, alongside of a huge fir-tree that had been broken off about 40 feet above the ground. It was first the intention to build the church behind the tree and cut a doorway through the trunk, thus making the tree the entrance as well as the bell-tower, but this plan was abandoned. A belfry tipped with a cross was built upon the top of the tree, a bell placed therein, and swung. To this day the ivy-clad fir is the bell-tower of the church. — *Chicago Times-Herald*.

WHAT "YOURS SINCERELY" MEANS. — Perhaps the jerry-builders of London who construct ceilings part of which tumble into one's soup and floors which unexpectedly drop into the cellar would not be so glib to subscribe themselves "Yours sincerely" if they knew the origin of the phrase. The *Stone Trades Journal*, waxing classic and Vitruvius-like, gives the source of the thing, which to students is old, but which may be new to the gentry who profess to provide shelter for a great part of the community. "The extent to which marble is entering into the decoration of modern buildings is but a repetition of the history of Roman architecture. The fact is that the old Roman jerry-builders used defective slabs of marble in erecting residences to sell at reduced rates, and covered up the defects with a cement of which white wax formed the chief ingredient. They looked just as stately as the others, till an exceptionally hot sun melted the wax and revealed the fraud. Hence, a perfect building was said to be 'sine cera,' or 'without wax,' and a friendship perfected by the trial of adversity was said to be 'without wax.' The signature 'sine cera,' as a symbol of genuine affection and probity, has been used ever since, and is perpetuated in the English word 'sincerely.'"

IRON-ORE BRIQUETTES. — An electrical process for smelting iron-ore has had a trial on an extended scale in Italy, no less than \$180,000 having been invested in a plant for the manufacture of 4,000 tons of iron a year. The works are at Camonica, in the north of Italy, where water-power is very cheap, an electrical horse-power for a year, or 8,760 working hours, costing only about \$10.50 to generate. The iron-ore is ground to a fine powder and intimately mixed with ground coke and limestone. The mixture is ground into small briquettes with a suitable binding material, such as tar, and heated by the electric current in suitably designed furnaces. A continuous output results, the slag and iron being drawn off from time to time. As compared with the old process, wherein the heat is supplied by burning coke in a blast-furnace, the cost is reduced nearly \$12 a ton for the finished product, which is a high carbon-manganese steel of great purity. Of course the figures given are based on the cost of coke, etc., in Italy. They would be much less in this country. — *The Little Chronicle*.

TREASURE-TROVE IN GREAT BRITAIN. — The curious history of the dealings with the ancient Celtic ornaments discovered in Ireland in 1896 is contained in a Parliamentary paper issued recently. The grave official document forms an amusing chapter in the complicated law of treasure-trove. These early examples of goldsmiths' work had been unearthed by a farm laborer while plowing a field near Limavady, and "passed into the possession" of a jeweller at Belfast, who in turn sold them to Mr. Day, a collector of antiquities and a Member of the Royal Irish Academy. This gentleman exhibited them in London, and the measure of their archaeological interest and intrinsic value was proved by the fact that shortly afterwards the Trustees of the British Museum purchased them for £600. For twelve months nothing happened. The museum plumed itself upon its new acquisition, and the vender, no doubt, looked back upon the transaction with the satisfied complacency of one who has done a good turn at the same time to his country and himself. The Royal Irish Academy suddenly awakened to a sense of the enormity which had previously escaped notice. For forty years past the Treasury has given it the refusal of all treasure-trove found in Ireland, yet here was a rival institution stepping in and taking away its birthright, while keeping suspiciously quiet about the transaction. The Irish Academy, now conscious of the injury done to the archaeological instinct of the Isle of Saints, demanded that the Government should forthwith bring in a bill to transfer the ornaments from Great Russell Street to Dublin. But the Trustees of the British Museum are precluded by statute from parting with any object they have once acquired — no entail was ever stricter than that which guards their gloomy portals. Mr. W. Redmond, laudably anxious that Irish antiquities should remain in the land of their origin, and, perhaps, not altogether averse from scoring off the Saxon, brought in a little bill to legalize the transfer, but it came to nothing. Ultimately, Mr. Balfour appointed a committee — which included Lord Rathmore, Mr. Morley and Sir John Lubbock — to investigate the rights of the case. After a decorous interval of nearly six months, the majority of these distinguished antiquaries and politicians recommended some relaxation of the law that prevents the British Museum from alienating its property. Feeling, however, that the matter had not advanced very far, the Treasury went to the Irish law-officers, who declared, without hesitation, that the ornaments were treasure-trove, and therefore Crown property, and that the Trustees were bound to hand them over upon demand. But in the matter of legal subtleties Great Russell Street was equal to the King's Inns. It pointed out that since the articles had been found in a field which, until within the last sixty years, formed part of the bed of the sea, they were not treasure-trove as defined by Blackstone. Upon this contention and by the light of some fresh data as to the circumstances of the discovery, the law-officers of the two countries came to a final conclusion that, assuming the legal establishment of these facts, the ornaments were treasure-trove and Crown property. Weighty matters of this kind must, of course, be conducted with leisured dignity, and this brought us to last March, rather more than four years after the first discovery of the relics. But still the British Museum did not move — it would give up nothing except in obedience to a judicial decision. The Solicitor to the Treasury has therefore been instructed, as Mr. Balfour has already stated in the House of Commons, to bring an action against the Trustees for the recovery of the ornaments, and a good many hundreds of pounds may be expended before judgment is delivered. Nor is it certain that this would end the matter so far as the Museum is concerned, since the law-officers have prudently declined to say whether that institution would have any remedy against Mr. Day, from whom it made the purchase. The situation bristles with entertaining legal possibilities; meanwhile the Irish members are not likely to show any falling off in their zeal for the archaeological riches of their native land. — *London Standard*.

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THE cataclysmal disaster that nearly overwhelmed Galveston last week is a reminder of more things than the uncertainties of daily life. Amongst other things it seems to show that the Weather Bureau officials are not yet quite able to predict the course of a storm nor, perhaps, able to state whether the disturbance will be a cyclone of wide diameter, or a storm cutting a path in a fairly direct line from beginning to end, like a hurricane or tornado. It also suggests strongly the advisability for those who own property in the "cyclone belt" of protecting that property by insuring it against damage from wind-storms in the same way that they protect themselves from loss by fire. The wisdom of insuring against wind-storms is shown by the fact that since 1889 [*sic.*], according to a statement made by the Continental Fire-insurance Company, three hundred and sixty-eight tornadoes have occurred in the United States, inflicting a property-loss of over twenty-three million dollars! These figures, compiled before the occurrence of this latest storm, are said to be from the official reports of the Government, and they certainly afford cogent reason for a large increase in this particular branch of the insurance business, so far as such increase would depend on the desire of prudent property-holders in the cyclone belt to secure such protection. It is not, however, a kind of insurance which we should care to find any insurance company in which we were interested as stockholders indulging in. The intelligence and activity of man can fight against and often conquer fire, but before the irrepressible ravages of flood and wind man seems nearly powerless and profitable insurance a chimera. The St. Louis cyclone of a few years ago showed that even the best of modern buildings were not absolutely secure from damage, and who can know that a storm-pressure or a vacuum might not be at some time created that would lift or topple over even the strongest and heaviest of steel-frame structures. It seems a very risky kind of business for the directors of insurance companies to meddle with. At the same time we hope that the new form of insurance may become popular for the reason that it will give the insurance companies added reason for insisting on a better style of building in the properties they insure. It is only now and then that a great storm occurs which few structures could hope to survive, while the greater number of storms, which now cause such damage to property and life through the collapse of flimsy brick and wooden houses, are not powerful enough to injure well-built structures.

A SCORE of years ago we were employed by a capitalist in search of a good investment to report upon the opportunities that lay before the manufacturer of American Portland cement. We made our inquiries and reported sub-

stantially, as we now remember it, that the opportunities for a good Portland cement were vast, as the use of it in this country was expanding rapidly, but that consumers were suspicious of the American brands then on the market, and much preferred to use, and were fully satisfied with, the English cements, at that time imported in great quantities; that if a good cement could be made in this country it must be marketed at a loss for years, until it had won a reputation. The report was distinctly unfavorable to the speculation. We were thanked, paid, and our hinted advice disregarded. The capitalist invested his money and lost it; because of what defect or miscalculation, we do not know. The same investment made a few years later would probably have yielded large returns, for the sale of the American Portland cements is now really vast in amount. The first variety was made in 1875 by a Pennsylvania concern, which disposed of seventeen hundred barrels in its first year and five years later sold only thirty-two thousand barrels, while ten years after that they were selling one hundred thousand barrels, the combined output of all the cement mills then in operation being treble that amount. To-day, again ten years later, the output of all the American mills exceeds four million barrels a year, and as the quality of the cement is being constantly bettered through the introduction of improved machinery and the application of a more understanding care during the process of manufacture, it is impossible to foresee to what dimensions this industry may grow. During this time the English brands have lost in favor, as the makers have been slow to adopt improved machinery, while at the same time the popularity of German cements and one or two of French and Belgian make has increased steadily. Thus, of last year's importations, a little over two million barrels, more than half was of German make, while English cement formed only one-tenth of the entire amount.

OF this vast amount of Portland cement, building operations probably consume less than a sixth. The balance is used by engineers in building bridges, water-reservoirs, docks, sewers, tunnels, road-beds and so on; and, as they use the largest quantity, it is the engineers' duty to concern themselves most actively in studying the properties of the several brands and suggesting to the manufacturers ways and means of improving the material in desirable directions. Architects are quite willing to accept and act on the deductions which are formulated by the more scientific profession. In performance of this necessary, if self-imposed, duty, the American Society of Civil Engineers is prosecuting an inquiry into the matter of the proper manipulation of tests of cements, and the committee in charge of the investigation has just published its preliminary report, a report which is full of interest for many reasons, for none more, perhaps, than because it presents so many diverse views. For this reason we may be thankful that only twenty-six out of the hundreds of members of the Society cared to make answer to the committee's list of seventy-odd questions. One would think the list long enough to bring out all the information desirable, and yet there are two questions which we would like to have had answered, and these two questions are: What is the true value of cement tests when regarded from the standpoint of the satisfactory meeting of practical requirements in average building or engineering construction? What becomes of the cement that is rejected at one job, because of failing to satisfy the tests of the engineer in charge? We believe that a true reply to the second question, a reply which could only be furnished by cement dealers—under compulsion, shall we say?—would go far to provide a true answer to the first. What becomes of all this mass of cement condemned by the voice of the engineering profession? In bulk it amounts to a good deal, and its manufacture has consumed much money. Its bulk is not to be dissipated by a breath of engineering disapproval, and cement dealers are not likely to leave unsold to a second party what a first one would not buy. It may be taken for granted, then, that condemned cement is nevertheless sold and used, by some one, for some purpose. If the use of cement that does not satisfy the appointed tests is so perilous, why do we not have to note the occurrence of a continuous train of constructional disaster in some degree commensurate with the bulk of the rejected cement? Supposedly, of course, rejected cement is sold later as second quality and used only for low-grade work where strength is not very material. Doubtless much of it is

so used, but we fancy that not a few not over-scrupulous dealers, knowing how greatly tests depend on the personal equation, do not hesitate to sell the cement rejected by one engineer to his neighbor around the corner, and no very real harm seems to result. We feel that there is a good deal of unnecessary particularity in this matter of tensile tests for cement.

THE answers set down in the committee's report reveal a state of considerable uncertainty, to say the least. To the question, How much cement may properly be accepted on the test of a single sample? even these twenty-six respondents give almost as many answers, and they run from a single barrel to a car-load, though a plurality favor testing one barrel in every ten. Chemical and microscopic tests are held by most to be needful only occasionally, in cases of inexplicable failure, or where adulteration is suspected. Crushed quartz is to be preferred to natural sands in testing cement mortars. Answers to questions relating to manipulation, proportions of ingredients, duration, and so on, are very various and often conflicting. In fact, the presence of the personal equation is everywhere conspicuous in the answers, many of them seeming to be based on mere acquired habit, pure and simple. The advisability of making compressive tests is admitted by a majority, it being generally stated that such tests would "correspond more closely to the conditions existing in practice" and that "there is no necessary relation between tensile and compressive strength." Professor J. B. Johnson, one of the most practical of scientific observers, going so far as to declare that there is "no necessity for tensile or cross-breaking tests." The utility of a bending test, in view of the many new uses of concrete, is advocated by seven of the thirteen members who answered the question. Finally, amongst many other interesting matters, the supposedly important question of using cement in low temperatures is treated as if it were not a matter of much consequence after all, the few answers quoted tending to show that the actual damage due to freezing is superficial, and can easily be negated by ordinary precautions.

IT seems to us that the editor of the *Brickbuilder*, in its last issue, while attempting to show how foolish is the man who employs an unskilled architect, makes an unnecessarily ambiguous statement. He declares that property-owners often entertain the idea that they can be held blameless, no matter what accidents befall, if only they have employed an architect of some kind, and says that this view is not sustained by the courts, which have "decided that if an owner is not wise enough to pick out a good adviser, he has no one but himself to blame when the results of the advice are not satisfactory." From this the editor infers that this attitude of the courts will lead owners to be more circumspect in the selection of their architects, and so it would if it were altogether true, and as far as it goes it will be helpful to properly-trained architects. But the statement, as made, equally allows the reader to draw the inference that an owner is wrong in believing his architect can be held responsible for mishaps, and this misstatement is one to carry comfort and rejoicing to the incompetent or fraudulent architect. The tendency of our courts, and, even more, the Canadian courts, is to hold architects to an increasingly strict accountability, and though one of the cases resulting from the Ireland Building disaster, which, we fancy, must be one of the cases the editor had in mind, has been sent back for retrial on the ground that it was doubtful whether the owner had "a right to rely on his architect," it is not yet known how the matter will result, and the nature of the architect's responsibility is, we believe, still undetermined.

THE employment of competently-trained architects is greatly to be desired, but we think that even they need not seek to have placed upon their shoulders any responsibility that can be avoided, and as there are no present means of always knowing who is trained and who is not, neither owners nor judges should be blamed for holding that there is no great difference between the good and the bad. In France, where these differences are better understood, and where the accountability of the architect in cases of building-accidents is assessed under very precise and severe rules, the judge in a recent case, where eight lives were lost, used this bitter language in rendering his decision in a suit for damages brought against the owner, the contractor and the architect of the collapsed building; speaking of the architect, he said: "Seeing that this de-

fendant was not qualified by any previous studies, by any exercise in the art of building, for the practice of the profession of architect, of which all the technical rules and the indispensable knowledge were unknown to him at the moment when he presumptuously charged himself with the erection of the building in question; considering that, in spite of his notorious inefficiency, he did not hesitate to undertake as his first job the preparation of plans and specifications for a six-story building and the supervision of the important operations involved," there could be no question of his accountability. Accordingly, the architect and the contractor were sentenced to eight months' imprisonment, and were furthermore condemned to pay heavy damages to the relatives of the slaughtered workmen. Now, a righteous judgment is refreshing and surely conduces in some degree to better building, done by competent men. But how many of our fledgling American architects would decline a commission for a sky-scraper through fear that a judge might, in event of a mishap the contractor could not keep them from, call them "presumptuous" and "notoriously inefficient." Moreover, in the French case the architect and contractor alone were punished, the owner being discharged, a decision which runs counter to the view which the *Brickbuilder* and the court, which sent one of the Ireland cases back for a retrial, seem to hold.

FRANCE, however, seemingly does not have a monopoly of bad architects, for here is the New York *Times* saying: "New York is full of bad architects. To be assured of that, one has only to walk around the block, any old block, any new block. It is also full of, or at least it is fairly supplied with, obscure architects." Measurably this is true, but architects in other towns could hardly expect a metropolitan paper to admit the fact quite so bluntly, though in very truth no one could walk along even one face of a block without noting the work of bad and obscure architects; and, unfortunately, some of the bad architects could not be called presumptuous and notoriously inefficient for the reasons assigned by the French judge. The *Times* makes its allegation, or confession, while referring to the correspondence now being conducted in the daily papers between the architects of the new City Prison and the defenders of the firm of architects, certainly far from being the peers of Messrs. Withers & Dickson, whom Tammany officials evidently wish to have supplant them. It is Penelope's web over again. Messrs. Withers & Dickson finish one part of the work — in this case it is the boiler-room, just as before it was the substructure for the cells — and then along come the Tammany architects, who pull it down because it is too weak or too small, or too something else, and rebuild it according to their ideas and at large expense to the city, of course. Such procedure is irritating, certainly, and as the original architects have earned reputations, and reputation is about all an architect finds he has when he has reached the age of Mr. Withers, they naturally object, and, as the matter is more political than professional, it is natural that their protests should get into the newspapers, and so the public hear more than they care to.

THE architects who are not in sympathy with the mosaic decoration with which Sir William Richmond is embellishing the interior of St. Paul's have once more addressed a letter to the Dean, in which they declare unabated interest in the building and reiterate their lack of sympathy with the work that is going on. As amongst the signers of the letter occur the names of Brydon, Belcher, Colcutt, George, Scott, Brooks, Champneys and Stevenson, it seems that this should be a protest that even a stiff-necked ecclesiastic could heed. The letter, after expressing the hope that the recent experiments on the dome may be abandoned as being "out of sympathy with the character of the building and injurious to its dignity," becomes a protest against a "red and gilded iron railing now being placed upon the main cornice." The protest seems both justifiable and consistent. The purpose of the railing is to enable tourists and other sight-seers to obtain in safety a closer view of the new decorations, while it is the common contention of the critics of the Richmond decorations that they are too bright, too coarse and garish, and that their only chance of becoming acceptable is through being toned down by time and dirt, or through being seen from the greatest distance the limits of the building allow. The protestants believe that to shorten the distance between the view-point and the decorations is unnecessary and illogical.

THE EVOLUTION OF DECORATIVE MOTIVES.¹—XIII.
THE ACANTHUS AND SPIRAL SCROLL.—III.



Fig. 203. Greek Corinthian Angle-volutes: *a* from Athens; *b* from Epidaurus.

ROMAN art, in adopting the externals of Greek columnar architecture and adapting them to its new requirements, found in the Corinthian column a feature peculiarly suited to the growing love of splendor of the Roman taste. The final form had been given to the type by a Roman architect, Cossutius, in the colossal temple of Zeus, at Athens; and this type, adopted a century later for the rebuilding of the temple of the Capitoline Jupiter at Rome, remained throughout the whole history of Roman architecture the most conspicuous and characteristic element in that art. Endless variations of detail were attempted from time to time, but rarely, if ever, did they depart from the

general proportions and typical arrangement of the original model, so far at least as the capital was concerned. Whereas it is hard to find in late Greek architecture two Corinthian capitals from different buildings alike, for instance, in the way in which the corner volutes and the acanthus-leaves under them are treated (the differences being oftentimes fundamental, as instanced by the two capitals shown in Figure 203), there are comparatively few



Fig. 204. Typical Roman Corinthian Capital, from Temple of Mars Ultor, Rome.

departures in Roman design from the accepted arrangement first perfected in the Temple of Zeus at Athens, and elaborated with consummate skill in the well-known and magnificent capital of the Temple of Castor and Pollux at Rome.

In this accepted type, shown in Figure 204, a slightly bell-shaped core, supporting a quadrilateral moulded abacus with concave sides, is almost wholly concealed by two encircling rows each of eight acanthus-leaves, occupying together two-thirds of the total height of the bell, and by eight pairs of branching scrolls, springing from *caulicoli*, or acanthus-leaf nests, whose stems are set between each pair of leaves of the upper row. The scrolls meet in pairs of volutes

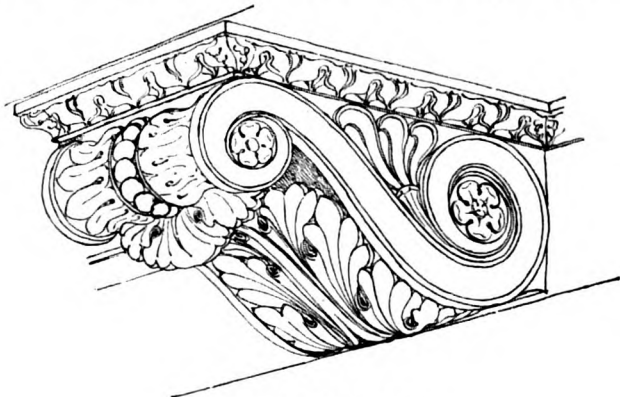


Fig. 205. Roman Modillion.

under the far-projecting corners of the abacus, and under the middle of each of its sides. Above each of these last-named four pairs is a strongly projecting rosette or flower. The total height of the capital is a little greater than the lower diameter of the shaft, and the total spread of the abacus (the side of the square from which it is cut) is

a diameter and a half. These general proportions and arrangements are not rigidly adhered to, but are approximated in nearly all the important Roman examples known. The chief variation was in the treatment of the volutes, which were sometimes replaced by symbolic forms — rams, dolphins, trophies of armor, etc. Pilaster-caps were somewhat more fully varied, at least in



Fig. 206. Console, North Door of Erechtheum.

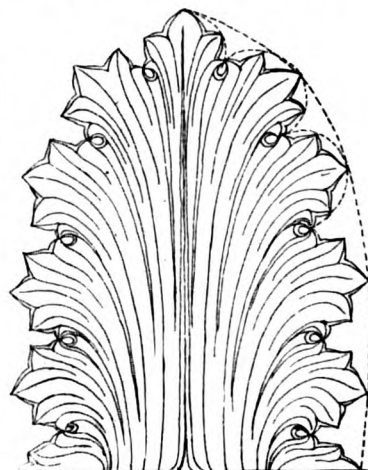


Fig. 207. Typical Greek Acanthus-leaf.

minor buildings; and the Composite capital was invented, late in the first century, as a variant of the Corinthian, and used chiefly on triumphal arches.

But the Corinthian order, as used in Greece, was not a complete order. It had neither a base nor a cornice especially fitted to its slender proportions and rich detail, and these the Romans (or their Greek artists for them) supplied. The Attic base was modified by dividing its scotia into two with a double bead between them; and the Ionic cornice enriched by adding to the denticular bed-mould a bracket-course under the corona. This came as near being an out-and-out invention as any in the history of architecture; it was a

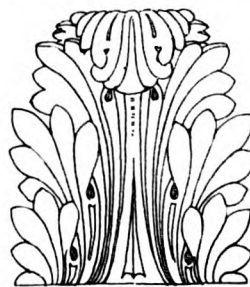


Fig. 208 *a, b*. Typical Roman Acanthus-leaves.

wholly successful and praiseworthy innovation. The Roman bracket, or modillion, was a combination in a new form of the two elements we are discussing, the scroll and the acanthus-leaf (Fig. 205). The reversed double scroll, or S-scroll, gave form to the outline of the bracket, while its under side was covered by a single acanthus-leaf, curled over at the outer end. This conception was not unknown to Greek art, as the celebrated consoles of the north door of the Erechtheum at Athens testify (Fig. 206). But the acanthus plays here only a very subordinate rôle, a small leaf, omitted on the cut, being applied under the console, of which it really forms no part; and neither this nor any other form of bracket was ever used in a classic Greek cornice. The



Fig. 209. Byzantine Acanthus-anthemion.

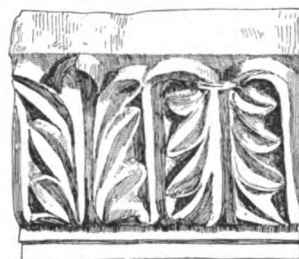


Fig. 210. Italo-Byzantine Acanthus-leaf.

credit for this adaptation and novel application of the S-shaped bracket belongs wholly to Roman art.

The acanthus-leaf, thus introduced into Roman art with the Corinthian capital, commended itself at once to the Roman love of rich detail by its endless possibilities of varied treatment and application. It lost the massive, stiff, sharply pointed form favored by the Greek

¹ Continued from No. 1275, page 69.

carvers (Fig. 207), and was converted into a richer, softer, more flexible leaf, more complex in structure, more easily lending itself to the wide range of decorative uses to which it was applied by the Romans (Fig. 208). On the Corinthian and Composite capitals it was made to curl outwards and over to a degree which in many

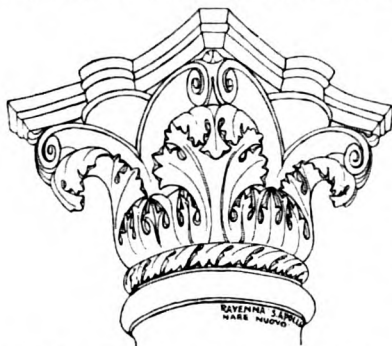


Fig. 211. Capital from S. Apollinare Nuovo, Ravenna.

cases seems to violate the essential character of stone and marble, while displaying the remarkable technical skill of the carver. The greatest possible variety appears in the modelling of these leaves, and especially in the treatment of their serrations and indentations. While in many cases the *acanthus mollis* of Italy is strongly suggested, in many others it is assimilated now to one and now to another of a dozen different herbs with indented and crinkled leaves.

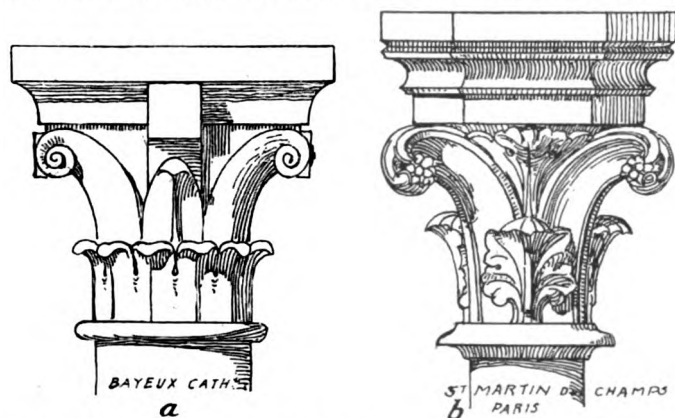


Fig. 212. French Early Gothic Capitals: a from Bayeux Cathedral; b from St. Martin des Champs, Paris.

the base of the leaf, the subdivision of the main lobe into minor leaflets, and the general roundness of these leaflets (Fig. 208).

Mediæval art inherited the traditions of Roman design, but maintained them with varying degrees of fidelity and persistence. In the Byzantine, or East Roman, Empire the Roman forms were early and radically modified, but in their modified form continued in use for nearly a thousand years. The acanthus-leaf underwent a curious change, to which allusion has already been made in treating of the anthemion. The leaf was flattened, to adapt it to the Byzantine system of flat surface carving in somewhat lace-like patterns formed rather by incision than by genuine relief. All the complex Roman modelling of pipes, eyes, ribs and subdivided lobes was given up, and the leaf evenly serrated with somewhat sharply-pointed teeth, from which tapering V-shaped channels led in curves to the centre of the base of the leaf. The result was a carved pattern strongly suggesting the anthemion, and the Byzantine carvers emphasized this suggestion by adding some of the accessories of the familiar anthemion patterns of Greek vases (Fig. 209), especially the "frame," and in some cases even by alternately reversing the leaves, as in Figure 210. The Corinthian capital lost its characteristic proportions and profile, in some cases being reduced to a sort of inverted cone-frustum with rudimentary volutes and incised leaf-patterns, as in the well-known capitals of the great nave-columns of Hagia Sophia at Constantinople; sometimes, like the example in Figure 211, recalling the details while departing from the proportions and spirit of the Roman prototype.

These radically modified variations of the acanthus-leaf and Corinthian capital persisted for centuries in the art of Eastern and Southern Europe, preserving the traditions of Classic design from utter extinction, and exercising a strong influence on the Roman-

esque style both of France and of the Rhenish provinces. Particularly in the latter are these survivals of Byzantine forms abundant both in carvings and capitals, many of which are remarkable for their vigor and elegance of design.

Meanwhile, the Roman tradition had in Italy and Southern France survived the fall of the Empire and all the destruction wrought by the Western barbarians.

The Romanesque monuments of Provence and Spain are full of reminiscences of Roman design, especially in their capitals and mouldings. The Corinthian capital was, indeed, the model upon which all French capitals were formed until, in the fourteenth century, naturalism in the foliage finally killed the tradition of the acanthus (Fig. 212). Figure 213, from the church at Avallon, illustrates how pure and vital was the tradition of the acanthus in the twelfth century, while even in the thirteenth the influence of this tradition is distinctly traceable in many of the most beautiful examples of French early Gothic carving (Fig. 214).

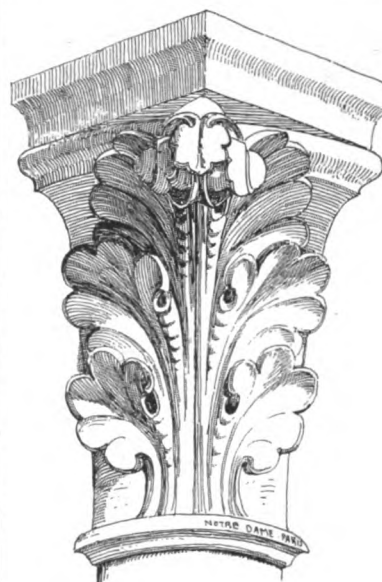


Fig. 214. Modified Acanthus: Notre Dame, Paris; Thirteenth Century.

In Italy, there was never a time, from the reign of Augustus until the Renaissance, when men were not carving acanthus-leaves, Corinthian capitals, Roman leaf-mouldings and scrolls among the details of all their changing styles: Italo-Byzantine, Tuscan-Romanesque, Basilican, Lombard, Tuscan-Gothic and Venetian-Gothic — all these styles betray in their details and minor ornaments the vitality of the acanthus and scroll. The Renaissance did not in this respect make a new departure or strike out a novel path. It merely emphasized, gave direction to and made universal, tendencies and practices already existing and asserting themselves in a fragmentary and sporadic manner.

But how rich, varied and beautiful was the decorative fruit of these old traditions thus replanted and cherished by the artists of the Renaissance! To illustrate adequately the extraordinary beauty and variety of the results achieved in the use of the Roman acanthus and scroll would require a volume. I can here only touch, in the most superficial way, upon a few points in this phase of Renaissance art.

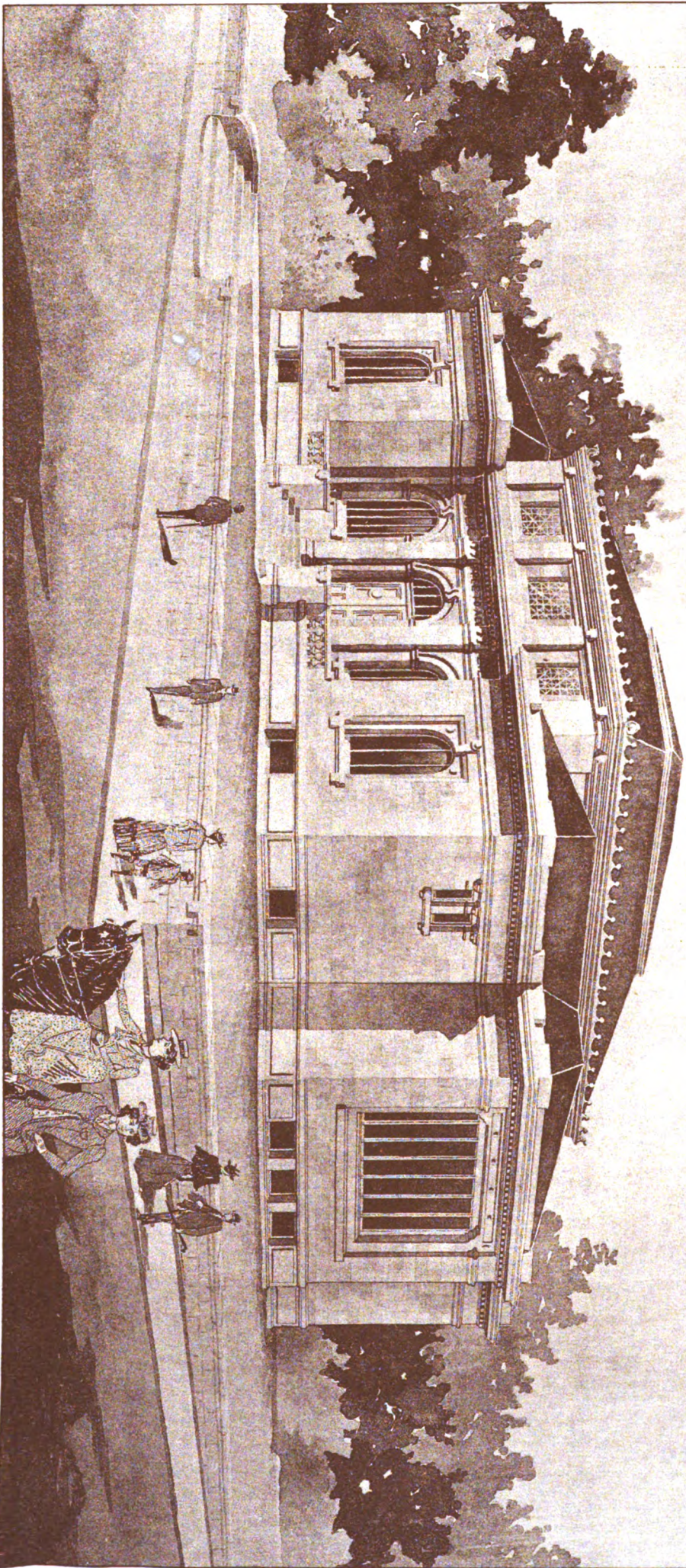
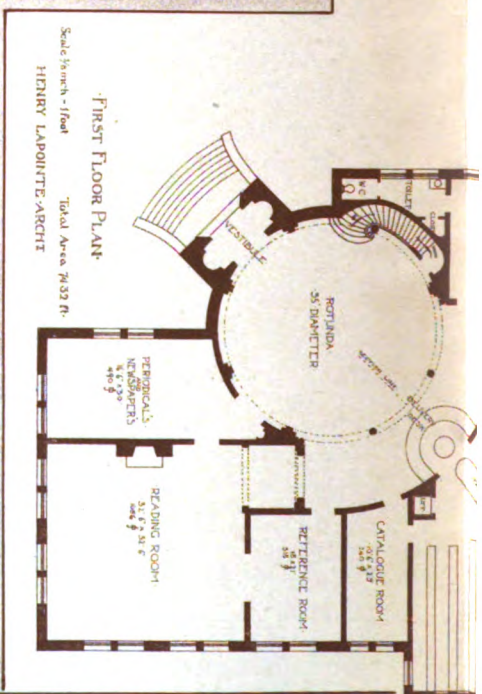
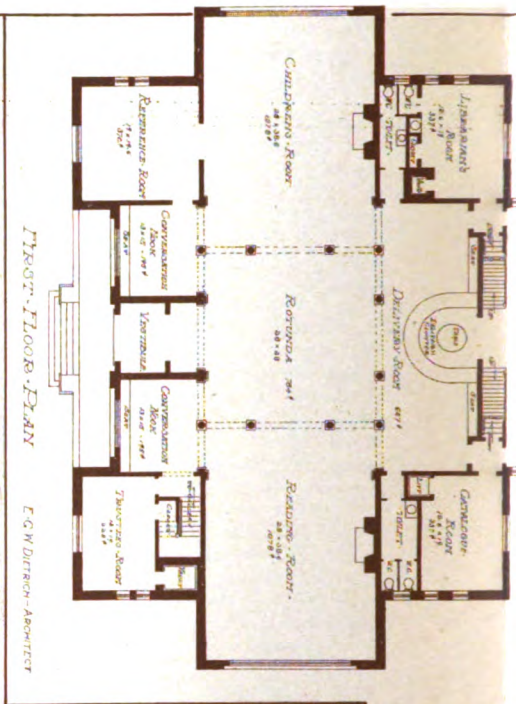
The "Mandoria" door of the Cathedral of Florence, dating from about 1399, furnishes a number of striking examples of the vitality of the Classic acanthus-tradition. The remarkable *rincaux* and leaf-mouldings of this doorway are like a presage of the Renaissance about to dawn. Its designers must certainly have inspired themselves from Classic models, so completely does their handiwork display the mastery of the Classic spirit as well as the Classic detail. Indeed, in the Metropolitan Museum at New York, the casts from these scrolls and mouldings have been hung among the works of the Italian Renaissance, though they antedate by twenty years the appearance of Brunelleschi in the competition for the dome of the cathedral — the event usually accepted as the starting-point of the Renaissance in architecture.

But these leaves and scrolls are heavy in comparison with those



Fig. 215. Bronze Acanthus: Medici tomb, Old Sacristy of S. Lorenzo, Florence.

of the second half of the fifteenth century — the masterpieces of such artists as Mino da Fiesole, Benedetto da Majano, Desiderio da Settignano, Andrea Verrocchio, Matteo Civitali, Pietro Lombardi, and half a score of others who wrought in Florence, Lucca, Sienna, Venice, Prato, Pavia, Bologna and Milan, in Perugia and Urbino,



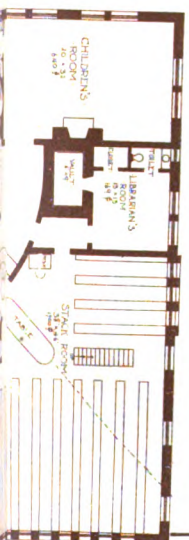
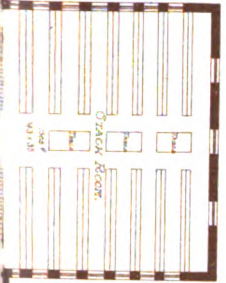
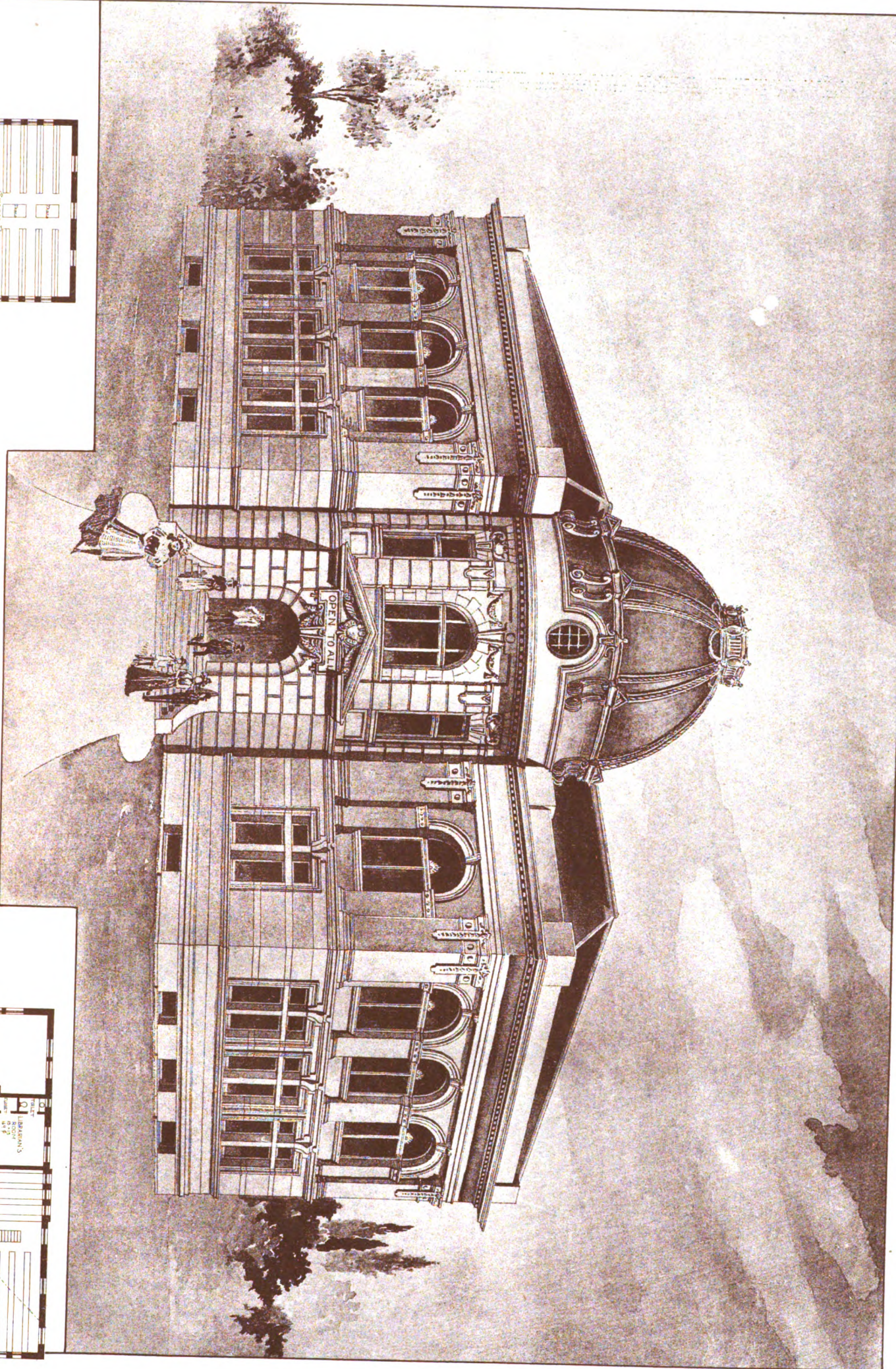
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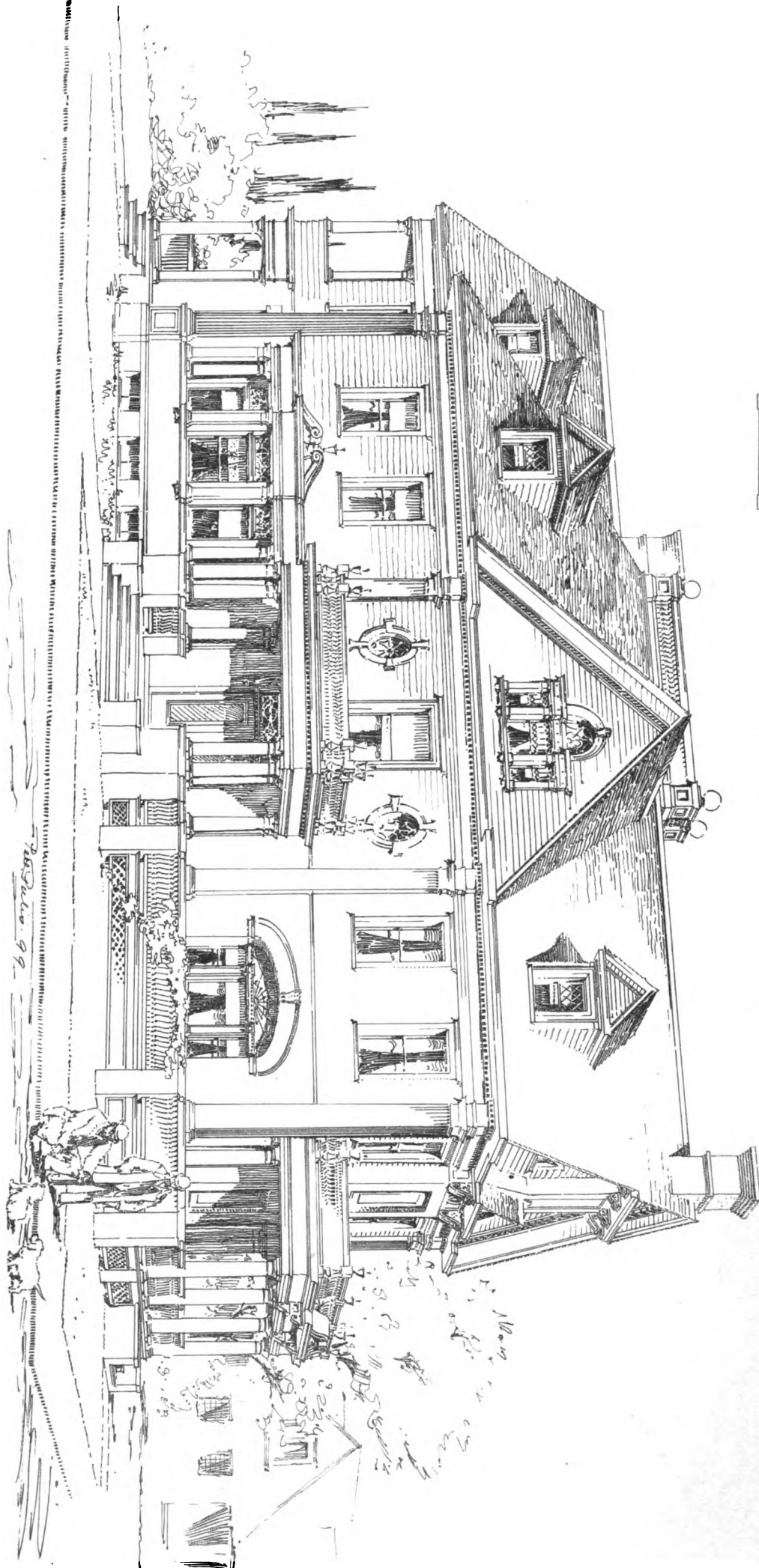
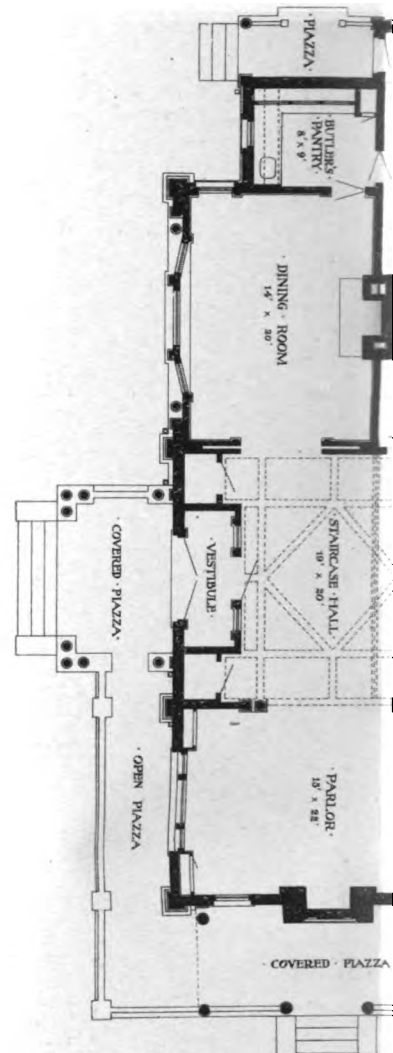
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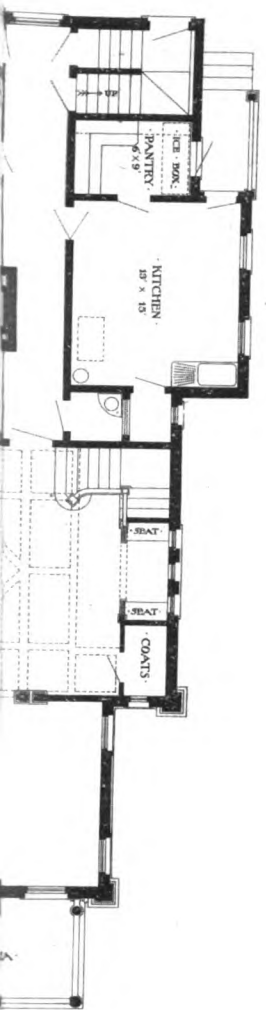
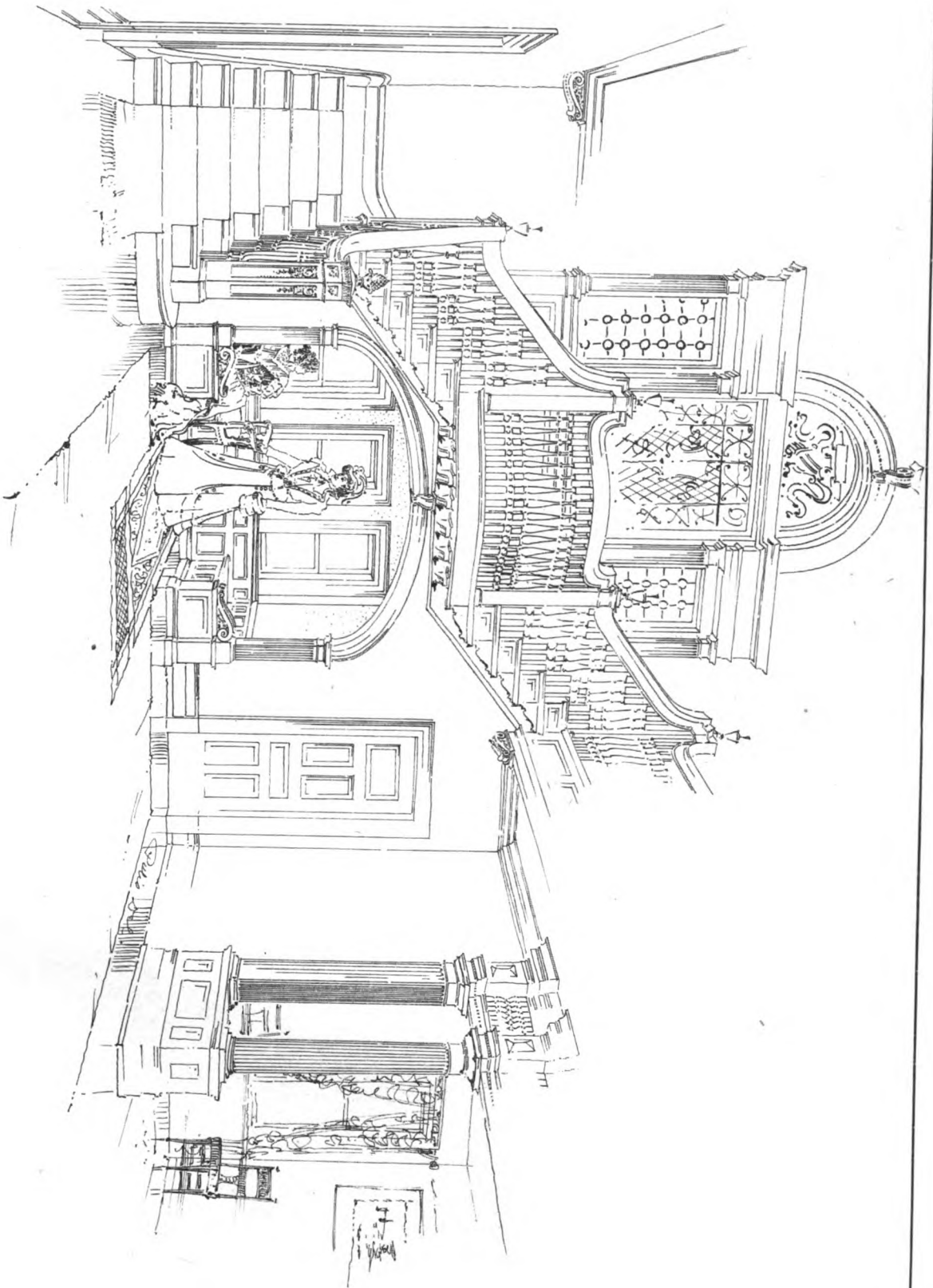
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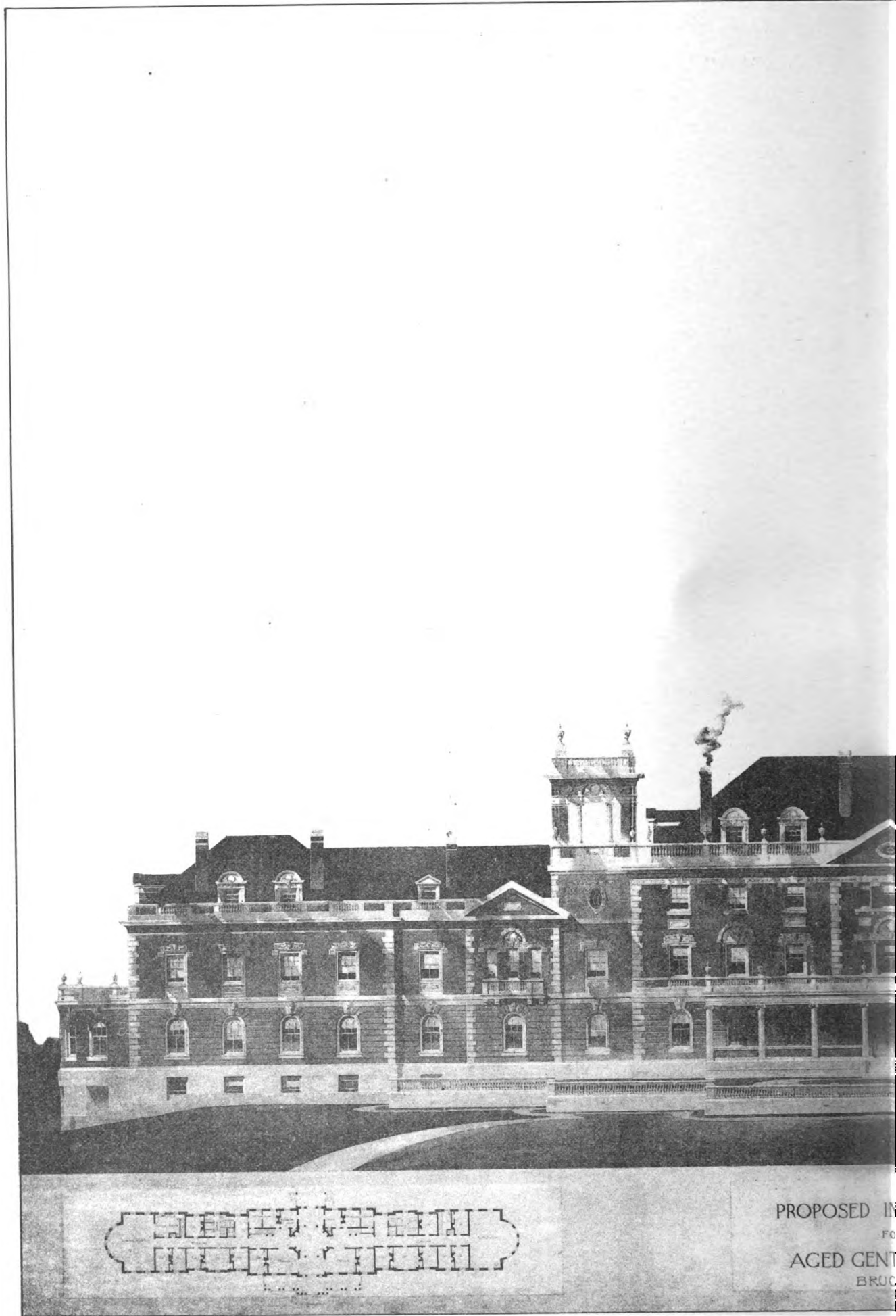
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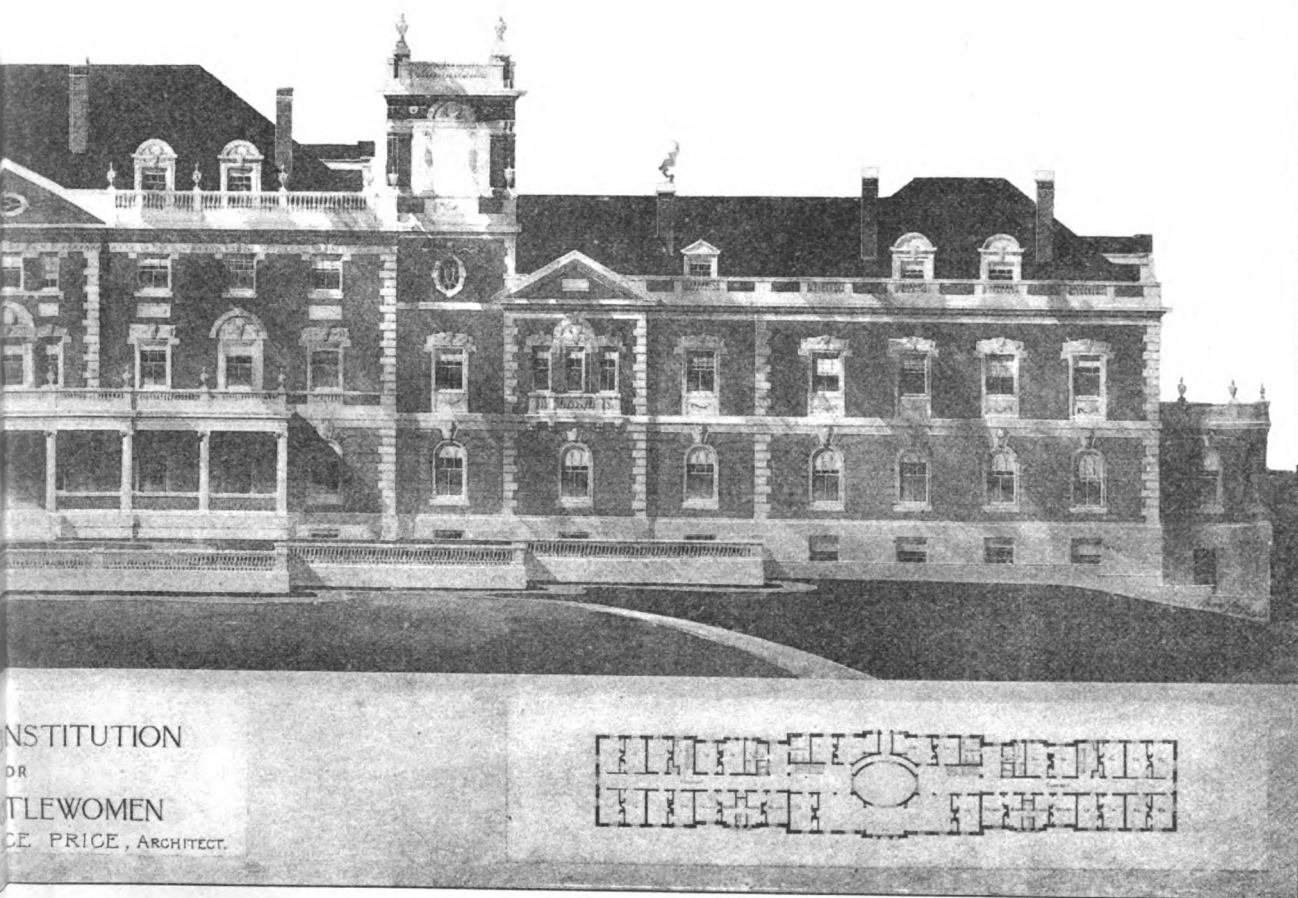






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and later in Rome itself; working in marble and wood, metal and inlay and terra-cotta. They outdid the Romans of antiquity and all the Greek carvers in the Roman employ, beating them, as it were, on their own ground. They moulded the acanthus-leaf to a thousand



Fig. 216. Acanthus bracket, Carved Wooden Stalls in Pal. Communale, Pistoia.



Fig. 217. Typical Francis I. S-scroll, Chimney at Blois.

new uses, with a delicacy, a freedom of imagination, and a grace of line never met with, even in the best Roman work. What use they made of it in their *rincaux*, or leaf-scrolls, we shall see later. Figures 215, 216 illustrate two out of the marvellous and uncounted varieties of form, modelling and application which we encounter in Italian Renaissance work.



Fig. 218. Pilaster-cap: Sta. Maria Maddalena dei Pazzi, Florence.

The scroll, too, received new life and value in their hands, not only in the Corinthian capital and free imitations of it, but in all sorts of brackets, consoles, corbels and other ornaments; particularly the S-scroll, which they developed almost into an independent ornament. The French especially affected the S-scroll, and in the carved ornament of the period of Francis I, it was used with great frequency in very effective combinations (Fig. 217).

But the most interesting feature of early Renaissance ornament is its capitals. These were, with but few exceptions, of the Corinthian type, but, with still fewer exceptions, they were free and fanciful imitations, not copies, of any Classic model. It is a curious fact that it is easier to find close copies of the Roman Corinthian capital in mediæval Italian work than in that of the early Renaissance, although the latter was avowedly inspired from the antique. The Corinthian, or Corinthianesque, capitals of pilasters and columns dating from 1430 to 1500 or 1510 resemble the antique only in general scheme. They retain the bell-shaped general outline, the moulded abacus with concave sides, the rosette or flower, at the centre of each side of this abacus, the lip of the basket or bell-core of the capital, the corner-volutes and the acanthus-leaves. But here the resemblance ends. In place of the sixteen volutes of the Roman type, they usually count but eight. The two rows of leaves about the bell are reduced to one; the sixteen leaves to eight or usually only four — a tall leaf under each pair of corner-volutes. The eight *caulicoli* are wanting; the scrolls either branch from four vertical stems, one in the centre of each face of the capital, or, more commonly, they are S-shaped, the inner ends meeting low down in



Fig. 219. Pilaster-cap, Tomb of Mat. Ferillus, Naples (1499).

the centre of each face of the capital, and forming a nest from which springs a flower, or anthemion, filling the vacancy on each face between the two huge corner-leaves. Not infrequently the usual outward curl of the volutes was reversed, the S-scrolls curling upwards and over inwards under the corners or horns of the abacus



Fig. 220. Capital from Pal. Gondi, Florence (1500-1510).

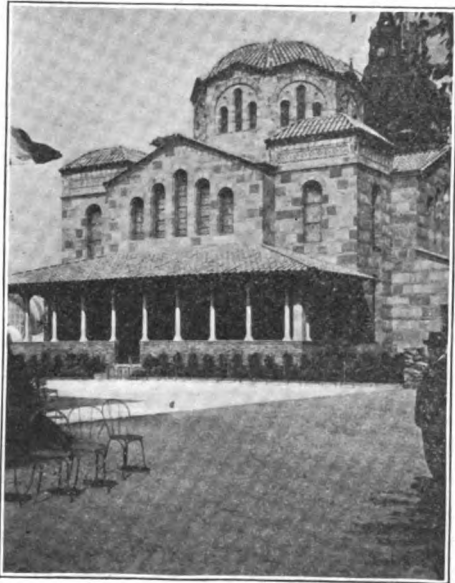
(Fig. 218). These characteristic features are illustrated in the Figures 218, 219, 220.

These deviations from Classic precedent were not the results of caprice or ignorance. Doubtless, the idea of minutely detailed study and close imitation of antique models had not yet come into vogue, and Vignolesque exactness was a conception *in futuro*, not *in esse*, in the fifteenth century. But this was really because the exuberant inventiveness and fancy of this remarkable period rendered unnecessary any such study and copying. These began to be resorted to only when the springs of originality and imagination had begun to run dry, and the taste in ornament had taken a turn towards sobriety and restraint. The capitals of this early period are well worthy of study for their grace of proportion, elegance of detail, and beauty of execution. If less magnificent than the Classic Corinthian, they are often more elegant, refined and varied, and far more appropriate to the class of structures they adorn — the tombs and pulpits, the stalls and doorways and light arcades in which Renaissance designers were so conspicuously successful.

A. D. F. HAMLIN.

[To be continued.]

FIRE HAZARDS.¹



The Grecian Building: Paris Exposition. L. Magne, Architect.

A TALL building, having openings in the floors from the roof to the basement, resembles closely a chimney-stack.

The contents and trim are the fuel in a fireproof building, and the air enters the windows, doors and other openings to support the combustion. As the contents are beyond control, it is essential that the design should be as dissimilar as possible to that of the furnace and chimney. The air-supply should be under some restriction, by keeping the windows and door-openings tight, and resistance should be offered to all tendency to flue-draught, by partitions and division of floors. Openings in a vertical line should not be encouraged, but when necessary for elevators and stairs such openings should be cut off from the rest of the building by fire-division walls.

It has repeatedly been proved that unprotected metal construction cannot withstand fire, nor can it be called "slow-burning." No matter how "fireproof" a building may be, it will be ruined if there is sufficient combustible material to create a hot fire lasting for sufficient time. The metal must be kept below the point of "redness." Metallic members should be made of at least sufficient thickness to

¹ Extract from a paper by F. deB. Parsons, read before the Franklin Institute, February 8, 1900, and published in the *Journal of the Franklin Institute*.

prevent rapid heating, even though they have excess of strength to withstand the stress to be actually carried.

For a building of good modern construction, the fire hazard of exposure is greater than the risk of fire within, and precautions should be taken in the original plans. This is seldom done, as the exposed sides are primarily designed for some architectural effect. A building is liable to take fire from an external hazard on every floor at the same time, a condition most difficult to control, and one that would never exist naturally from internal causes.

Modern tall buildings make most efficient "fire-stops," but they are not designed for that purpose.

Manufacturers have produced many forms of fireproofing protection, and have striven to obtain something that will not burn. Architects and engineers have given too much attention to the subject-matter of which the fireproofing is made, and not enough to its proper application.

No building-material has better fire-resisting qualities than good hard-burned brick set in cement mortar. Most stones are injured by heat, and marble, granite, sandstone and slate are liable to disintegrate or fracture under the action of heat and water. All fancy ornamentations of stone, such as balconies, cornices, trim, etc., are extremely dangerous, from the fact that they are liable to fall during the conflagration.

Terra-cotta in certain forms has been used for trim, but it has been found that terra-cotta, while a good fire retardent, will be seriously damaged on the thin edges, and will necessitate subsequent removal and renewal. The cost of this renewal of stone and terra-cotta on the façade of a building will be much greater than the cost of the actual material injured, as much of the backing will have to be taken down although in itself uninjured. This was shown in the Pittsburgh and Home Life fires.

Bonds and pier-caps are frequently made of stone and subjected to great weight. As these are usually unprotected, they are dangerous, and it would be much better to use cast-iron. In the same manner, stone columns carrying great weight cannot be recommended; their unreliability to withstand the action of the heat and water is an item which must be kept in mind, both from the financial viewpoint of cost of renewal and from the danger of failure, thus dropping part of the building, which otherwise would have stood.

The floors should be solid, to prevent the fire from spreading, and the beams and girders be well imbedded and protected, so that no part of the metal will be exposed. While most fireproofing substances have proved to be excellent, it must be remembered that there is a choice of grades, and that many of those grades are deficient in fire-resisting qualities. The greatest weakness with all floor-arch blocks is an exposed thin edge. Most arches have such an edge, covering the lower flange of the floor-beams. These thin edges are apt to break off and expose the metal. It is still an unsettled question whether hard-burned tile, porous hollow-tile, ordinary bricks or solid construction of cement is the best.

The under side of floors, forming the ceiling beneath, should always be finished flat and smooth. The custom of having a panelled ceiling, by permitting girders and beams to project below the main level, should not be sanctioned without penalty, as it is difficult to protect these important members when thus arranged and to prevent them from retaining the smoke and heat in the pockets thus formed. The consequent local heating and irregular expansion may cause serious trouble. When such projections must exist, it would be well to supply a false ceiling made with expanded metal and plaster.

In tall buildings, where the ground-area is limited and valuable, it is not feasible to construct the floor without openings. Fire can only spread from floor to floor through such openings for light, stairs, elevators, dumb waiters, chases for pipes and wires, etc., or externally from window to window. This hazard is grave, since it can only be overcome at the cost of inconvenience and considerable expense. The modern mill-construction is admirable in this regard, where the floors are solid and the openings are made in an adjoining tower-like building, or in parts separated and cut off by permanent fire-walls. As both of these methods are wasteful of area, they will not be countenanced by owners of tall buildings for city use. The closest approximation to such mill practice, however, should be adopted. The elevator and stair wells should be enclosed in fire-walls of brick, with all combustible material removed. Elevator entrances are usually open lattice-work, a hazard which could be rectified by using fire-doors or metal roller-shutters that could be closed in cases of emergency. Openings for pipes and wires should be packed with non-combustible material. Any opening will act as a flue, and it is remarkable how rapidly fire will pass through the smallest crevice.

Besides the risk of fire, the hazard of water-damage is seriously increased by these openings. Floors should be waterproof, and so arranged that the surplus of water may not pass down an opening to the injury of the floor or contents below.

Subdivision of the floor-area by partitions reduces the hazard very materially. Partitions act in three ways: they confine the fire; they keep it back from the floor-openings or draught-areas; and they diminish the rapidity of spread, giving time for assistance to arrive. Partitions that are not fireproof are valueless and increase the hazard by preventing close approach to fight the flame and by the cost to replace. Wooden studs covered with metallic lath and plaster are not to be treated as fireproof. Such partitions may withstand a fire,

but are liable to damage to such an extent as to require renewal, since the wood chars beneath the plaster and lets the nails pull out.

Partitions should not rest on wooden sills or flooring, but be built on the arches and extend to the bottom of the arches above. This precaution is often neglected. Partitions should be solid, with as few openings as possible, in order to be most effective, as openings cut for doors and transom-lights decrease their value as a fire-retardent.

Comparisons have been drawn between fire-partitions and brick walls. It is not reasonable to expect that partitions made of 2 inches of concrete plaster on expanded metal, or of 4-inch terra-cotta blocks, can withstand the same severe punishment as a 12-inch brick wall. Both fire-walls and partitions have their legitimate duty to perform, and the inspector should not underrate the hazard by mistaking the one for the other.

Fire-walls are especially valuable. Buildings covering a large area should be divided by such walls. If there had been some such division in the Windsor Hotel, the building could have resisted much longer. Every one has noticed how a thin brick wall will remain standing, even though a building be gutted and every floor falls. A thin party-wall will hold a fire and prevent its spreading. Curtain-walls, carried on the metal "cage" frame, are not as reliable as self-sustaining walls of equal thickness.

Combustible contents must be expected, but the quantity of combustible material in the trim and finish of a building, and the manner of its application, directly affects the hazard. The amount of wood used in an average so-called "fireproof" building having wood flooring, base, chair-rail, door and window trim, amounts to about 2 pounds for each cubic foot of contents, without including the furniture or movable fittings. This would exceed the weight of the metal in a skeleton frame and be equal, or nearly so, to that in a cage frame. Without injury to the usefulness or efficiency of a building, the amount of combustible material could be reduced by careful planning. The wood floors could nearly all be left out, or, if retained, used only on limited areas and laid thin and solid on the concrete filling. An air-space under flooring should never be allowed, as it is extremely hazardous. Nearly all the door and window trim can be made of adamant plaster, and the only wood required would be for jamb and lintel. As the edges of partitions are always rough, the carpenter usually puts on the trim with an air-space behind it. This air-space should be filled with absolutely incombustible and permanent material.

Bases and chair-rails are useless ornamentation, and their value could be better utilized in some form of real fire-protection. It is not necessary to use wooden studding for nailing purposes, as nails will take a firm hold in terra-cotta. In general, all woodwork should be omitted except where absolutely necessary, and then used on the slow-burning principle.

Windows are dangerous because they let a fire enter from without, and supply air and draught to a fire within. In consequence, they should be as small in size and as few in number as the circumstances will permit. They should be protected with shutters. When shutters are not feasible, wired glass should be used, and in exposed positions the glass should be doubled, with an air-space between. There is no reason why wired glass cannot always be used for windows on elevator and stair wells, and for door-panels and transom-lights. Wired glass has one advantage over shutters, in the fact that windows are less likely to be left open.

The main parts of the buildings should be made self-supporting, no matter what happens. Heavy weights, such as tanks, elevator appliances, cornices, balconies, and the like, should be so constructed as not to fall, except in cases of total destruction. The hazard from falling weights is most serious in impeding the firemen, in breaking openings through the floors which would act as draught-flues, and in damaging parts of the structure which would otherwise have been uninjured.

Smoke-flues cause an annual loss to the insurance companies doing business in the United States of upwards of \$20,000,000. In modern tall buildings, however, the hazard from these flues is reduced to a minimum, on account of the manner in which such buildings are constructed.

Expansion and contraction cause hazards which cannot be neglected. Every material used in construction expands on the application of heat, and the amount of expansion is not uniform. In composite construction — that is, where part is metal and part stone or brickwork — the difference in the lengthening of the various subdivisions in a tall building may be sufficient to create severe cross strains that may cause failure of certain details which otherwise would have withstood the heat. In many fires, external and fire-division walls have been thrown down by the expansion of the main metallic members. The design should provide allowance for expansion in all parts where the amount of lengthening would cause damage or failure.

There can be no question but that there is a hidden hazard in metallic members subjected to rust. Rust is a process of slow combustion, and, if allowed to progress, will eat away the members to an extent that may render them so thin as to heat rapidly, or to fail under a normal load. Metallic members, therefore, buried in masonry cannot be considered as safe as those which are located away from such masonry and protected with some good fire-retarding covering, which could be removed from time to time for the purposes of inspection.

In a broad sense, there are two separate methods of construction — one of them monolithic in character, the other built up of small pieces, joined or cemented together by some different substance. Monolithic construction has the great advantage of solidity and uniformity, and from it small pieces are not apt to fall or break out, thus forming draught-areas or flues. On the other hand, the financial hazard of such construction is great, for, if any damage is created, a greater quantity of good material must be taken out and replaced than if the construction were made up of smaller pieces.

A building of the Walker Soap Works, in Allegheny City, was exposed to fire on May 25, 1899. The fire occurred in a brick building 14 feet away, and for the time was very intense. The building was built of steel framework, filled in with cement walls, retained on expanded metal. The construction was monolithic, and withstood the heat with but slight injury, although the brick building was greatly damaged.

One of the most serious troubles is the alteration of the plans after the work has been started. The original design may call for a well-protected building, but, through carelessness of inspection or the desire to save a little money, the character of the building may be changed to a veritable fire-trap.

The question naturally arises whether it pays the owner to make a building thoroughly fireproof. Unfortunately, there are many who build for the specific object of obtaining the greatest income from a minimum outlay, and the effort to save on the first-cost is so great as to render their judgment valueless as to what should or should not be done. Tall buildings of cheap construction are a menace not only to owners and tenants, but to the community. In any building there must be, and always will be, an amount of combustible matter that cannot well be reduced.

Owners frequently locate floor-openings so as to take up a minimum floor-space, and thus render a maximum area available for income-earning purposes. Nearly ever builder estimates the amount of space devoted to public use, and concludes that the best building is the one that has given up the least percentage. While this effort is commendable from a purely income-earning standpoint, it often renders the design dangerous to life and property, and frequently makes it impossible to design a building under such conditions that it shall be fireproof. When stairs and elevators are placed together in the same well, there must always be a strong tendency to cut off means of escape and means of saving property from floors above.

Even in a fireproof building dependence must be had upon human aid; and when the building is tall, it towers beyond the reach of any fire-department.

A fire in the lower part is easily accessible, and the hazard most dreaded is that of a fire in the upper stories. The water-tanks as usually supplied on roofs of tall buildings are inadequate in capacity. Unless the pumping-plant of the building be so situated as not to be injured or rendered useless, the tank hardly pays for its cost in cases of severe fire.

Owners do not hesitate to spend thousands of dollars on fancy marble panelling, architectural carving and similar ornamentation, and will refuse to spend a few hundred dollars to have plans properly prepared and to see that the dangerous parts are constructed with that care which a really fireproof building should demand.

From the viewpoint of the fire-insurance companies, it appears as if such companies had no interest in actual fireproof construction. Such should not be the case, for anything that will tend to reduce the fire-hazard will necessarily tend to reduce the fire-loss. The gross business of the companies might be reduced, but the net income would be increased. Unfortunately, they do not act in unison, and each one seeks risks which are dangerous in character, through a sheer spirit of competition. The influence for good that could be exerted by insurance companies is great, provided they would properly classify their risks, charging penalties or reducing their rates in accordance with the elements of design and the means employed to secure really fireproof construction.

ILLUSTRATIONS

[Contributors of drawings are requested to send also plans and a full and adequate description of the buildings, including a statement of cost.]

RESIDENCE FOR FRANK W. SIMMONS, ESQ., OTTUMWA, IA. MR. F. R. COMSTOCK, ARCHITECT, NEW YORK, N. Y.

THE exterior of the residence, which was built last year, is of narrow clapboards, painted Old Colonial red. The porch trimmings, pilasters, and cornices and window-finish are painted an ivory-white and the roof-shingles a moss-green.

The interior finish of the house is entirely of cabinet-work, the staircase, hall and parlor being finished in quartered-oak, and dining-room in mahogany. The entire second story is of white-pine, painted to harmonize with the scheme of decoration.

COMPETITIVE DESIGNS FOR THE PUBLIC LIBRARY, EAST LIVERPOOL, O. MESSRS. E. G. W. DIETRICH AND HENRY LAPOINTE, ASSOCIATED ARCHITECTS, NEW YORK, N. Y.

PROPOSED INSTITUTION FOR AGED GENTLEWOMEN. MR. BRUCE PRICE, ARCHITECT, NEW YORK, N. Y.

[The following named illustrations may be found by reference to our advertising pages.]

"CITADEL," ETON HALL, NEAR CHESTER, ENG. MR. J. E. BOEHM, SCULPTOR.

CENTRE VESTIBULE: GRAND PALAIS DES CHAMPS-ÉLYSÉES, PARIS, FRANCE. MR. ALBERT THOMAS, ARCHITECT.

This plate is copied from *l'Architecture*.

[Additional Illustrations in the International Edition.]

THE DELIVERY-ROOM OF THE PUBLIC LIBRARY, PROVIDENCE, R. I. MESSRS. STONE, CARPENTER & WILLSON, ARCHITECTS, PROVIDENCE, R. I.

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METALWORK, — XI: NO. 516 MADISON AVE., NEW YORK, N. Y.

METALWORK, — XII: NO. 304 MOTT ST., NEW YORK, N. Y.

PLAN OF SELECTED DESIGN FOR NEW SESSIONS HOUSE, OLD BAILEY, LONDON, ENG. MR. E. W. MOUNTFORD, ARCHITECT.

DETAIL OF ELEVATION OF SAME BUILDING.

NOTES AND CLIPPINGS

AGE OF CALIFORNIA'S BIG TREES. — The Department of Agriculture has issued a report on investigations of the big trees of California that brings out some interesting and new conclusions. It shows that the dimensions of the big trees are unequalled and that their age makes them the oldest living things. They are described by the report as "the grandest, largest, oldest, and most majestically graceful of trees," and "the scarcest of known tree species, with the extreme scientific value of being the best living representatives of a former geologic age." The report says the bark of the big trees often is two feet thick and almost non-combustible. "The oldest specimens felled," it says, "are still sound at the heart, and fungus is an enemy unknown to it. Yet the big trees apparently have not increased their range since the glacial epoch. They have only just managed to hold their own on the little strip of country where the climate is locally favorable." Continuing, the report says: "The only grove now thoroughly safe from destruction is the Mariposa, and this is far from being the most interesting. Most of the other groves are either in process of, or in danger of, being logged. The very finest of all, the Calaveras Grove, with the biggest and tallest trees, the most uncontaminated surroundings, and practically all the literary and scientific associations of the species connected with it, has been purchased recently by a lumberman, who came into full possession on April 1, 1900. The Sequoia and General Grant National Parks, which are supposed to embrace and give security to a large part of the remaining big trees, are eaten into by a sawmill each and by private timber claims amounting to a total of 1,173 acres. "The rest of the scanty patches of big trees are in a fair way to disappear—in Calaveras, Toulomo, Fresno, and Tulare Counties they are now disappearing—by the axe. In brief, the majority of the big trees of California, certainly the best of them, are owned by people who have every right and in many cases every intention, to cut them into lumber." The most recent investigations, according to the report, confirm the estimates that these giant trees probably live 5,000 years or more, though few of even the larger trees are more than half as old. The average rate of growth is estimated at one inch of diameter for every twelve years. The report also corroborates the statements of one authority who says that one tree, on which he counted 4,000 rings, was undoubtedly in its prime, "swaying in the Sierra winds, when Christ walked the earth." The report states among other things as the result of the official investigations: "The only place in the world where the big tree exists is in ten isolated groves on the west slope of the Sierra Nevada Mountains. The species, however, represent a surviving prehistoric genus of trees once growing widely over the globe. The Southern groves show some reproductions, through which there is hope of perpetuating these groves. In the Northern groves the species hardly holds its own." — *Exchange*.

WASTE IN MAKING ARTIFICIAL LIGHT.—Under the best conditions obtaining at present, out of every 100 tons of coal delivered at gas-works or electric-light stations, something like 98 tons are, as far as the production of light is concerned, absolutely wasted and go to produce useless heat. When one considers the enormous quantity of coal used annually for the production of artificial illumination, the absolute waste of 98 per cent of it seems little short of criminal. Will the problem ever be solved? It must be confessed that at present the prospects are far from being bright. Some means must be found of exciting ether vibrations between the visible limits only, and of eliminating the slow, radiant heat-waves. Whatever method may be eventually employed, it is interesting to note that already, on a small scale, the problem has been solved by the firefly, the most delicate measurements having failed to detect any radiant heat in the light emitted by this little creature. Surely this ought to be an interesting subject for investigation by the physiological chemist, who, working in conjunction with the physicist, might enable us to get nearer the solution of this important question.—*Cassier's*.

THE IRONWOOD TREE.—A circular was recently forwarded to the chief Forest officers asking for information with regard to the ironwood tree of Pegu, and the result is an interesting and complete article published as a further contribution to the *Agricultural Ledger*. The tree flourishes in many provinces, particularly in Madras, Bombay and Burma, thriving best in moist localities. It grows to an enormous height and reaches maturity in 60 or 80 years in Madras, but in the Bombay Presidency 100 years is fixed as the commercially-exploitable age. The wood is hard, resinous and dark-colored, and is highly appreciated in localities where it is to be had in fair abundance. It is much stronger than other woods of exceptional strength, and is so hard that a rifle-shot at 20 yards distance will scarcely cause any penetration into it. It seems to be a favorite wood for scaffolding, and lasts well when kept from damp. It is also used for railway-sleepers and telegraph-posts. The Burma State Railway was laid with sleepers of this wood in 1877, and the majority were still good in 1894. A quantity of sleepers was sent from Burma to Madras and Calcutta in 1885-86, and the profit which accrued from the works in the Pegu Circle amounted to 36 per cent. Trees of 3 to 4 feet girth are used as house-posts and bridge-piles in Pegu, and for these purposes it is said to be unequalled for its durability, while one mill in Pegu is supplying planks for paving-blocks in England. The discovery of tannin in the properties of the wood, a year or two back, has imparted new interest to the wood. Mr. H. R. Proctor, of the Yorkshire College, who made the discovery, is of opinion that the new product will prove a valuable tanning material, the color of which is fair and is a satisfactory agent.—*Indian Import and Export Trade Journal*.

KRUPP IRON-WORKS.—A report from Richard Guenther, U. S. Consul-General at Frankfort, describes the vast industries carried on by Frederick Krupp. These comprise the following: Cast-steel works at Essen; Krupp Steel Works, formerly F. Ashthöwer & Co., at Annen, in Westphalia; the Gruson Works, at Buckau, near Magdeburg; four blast-furnaces at Duisburg, Neuwied, Engers, and Rheinhausen (this latter consists of three furnaces with a capacity for each of 240 tons per 24 hours); a foundry at Sayn; four coal mines (Hanover, Saelzer, Neuack, and Hannibal), with interest in other coal mines; more than 500 iron mines near Bilbao, in northern Spain; shooting-grounds at Meppen, with a length of 10½ miles and a possibility of extension for 15 miles; three ocean steamers, several stone quarries, clay and sand pits, etc. In addition, the firm of Frederick Krupp operates the Ship and Machine Stock Company Germania at Berlin and Kiel, under contract. The most important articles of manufacture of the cast-steel works at Essen are cannons [up to the end of 1899, 38,478 had been sold], projectiles, percussion caps, ammunition, etc.; gun-barrels; armor-plates and armor-sheets for all protected parts of men-of-war, as also for fortifications; railroad material, material for ship-builders, parts of machinery of all kinds, steel and iron plates, rollers, steel for tools and other purposes. The steel-works in 1899 operated about 1,700 furnaces, forge fires, etc., about 4,000 tool and work machines, 132 steam-hammers of from 200 pounds to 5,000 metric tons' force, more than 30 hydraulic presses (among them 2 of 5,000 tons each, 1 of 2,000 tons, and 1 of 1,200 tons' pressure), 316 stationary steam-boilers, 497 steam-engines with an aggregate of 41,213 horse-power, 558 cranes of from 400 to 150,000 tons' lifting power. During the last year, the iron mines yielded an aggregate of 1,877 tons of ore per day. The coal production from the mines belonging to the Krupp Company (excepting the Hannibal) amounted, on an average, to about 3,738 tons for each working-day. The consumption of coal and coke in 1899 was as follows: In the cast-steel works at Essen, 952,365 tons; in the other works and on the steamers of the company, 622,118 tons; in all, in round numbers, 5,000 tons per day. The consumption of water at the cast-steel works in 1899 was 15,018,156 cubic metres, which equals about the consumption of the city of Frankfort, with 229,279 inhabitants. The consumption of gas in the steel-works at Essen was 18,836,050 cubic metres in 1899. The electrical-power plant of the works at Essen has three machine-houses, with six distributing stations, and supplies 877 arc-lights, 6,724 incandescent-lamps, and 179 electric-motors. For the traffic of the works, railroad tracks of standard gauge of about 38 miles are laid, which connect with the tracks of the main railroad-station at Essen. Sixteen locomotives and 707 cars are operated on the grounds. In addition, there are narrow-gauge tracks of 28 miles, with 26 locomotives and 1,209 cars. The telegraph system of the steel-works has 31 stations, with 58 Morse telegraphic instruments and 50 miles' circuit. The telephone system has 328 stations, with 335 telephones and a circuit of 200 miles. On April 1, 1900, the total number of persons employed in the different works was 46,679, viz., 27,462 at Essen, 3,475 at the Gruson Works of Buckau, 3,450 at the Germania Works at Berlin and Kiel, 6,164 in the coal mines, and 6,128 at the blast-furnaces and on the testing-grounds at Meppen, etc.—*Exchange*.

THE FATHER OF RAILWAYS.—As George Stephenson never contradicted those who styled him, during his lifetime, "the Father of Railways," it has lately been asserted that he had tacitly permitted an injustice to the memory of William James, a great, if unfortunate, railway projector and pioneer. William James, who was born at Henley-in-Arden, Warwickshire, in 1771, became a successful solicitor, worth £150,000; and he at one time earned £10,000 a year by his practice. Having projected and surveyed over a dozen railways, including the Manchester and Liverpool Railway, principally at his own expense, his affairs fell into confusion; and he died at Bodmin, in 1837, leaving a family unprovided for. Lately it was proposed to erect a monument to the memory of Mr. James, of whom Robert Stephenson—more generous than his father—wrote to Mr. James's eldest son in 1844: "I believe your late father was the original projector of the Liverpool and Manchester Railway." The subject is fully dealt with in the *Railway Magazine* for July and October, 1899, and for May, 1900. It is there stated that when George Stephenson was a lad of eighteen, beginning his education, James was already laying out plans for railroads. In 1821 James paid a visit to Killingworth, and saw Stephenson's steam locomotive-engine, the possibilities of which so impressed him that he entered into a kind of partnership with Stephenson in 1815 and 1816; James on his part promised to give his assistance in using Stephenson's locomotives in all districts where he had influence. Although the route surveyed by James was not that adopted for the Manchester and Liverpool Railway, which was taken up and completed by George Stephenson, there seems no reason to doubt he earned and deserved the title of "Father of Railways" in this country. A grandson of William James—Mr. H. B. James, No. 69 Victoria Street, S. W.—is well known in the railway and engineering world as a contractor and engineer, and has had a varied and successful career. He was responsible for the construction of the sea-defences at Cleethorpe and the marine works at Hythe, and other important undertakings.—*Chambers's Journal*.

ARCHÆOLOGICAL FINDS IN TEXAS.—Images of the gods of the pre-historic inhabitants of the valleys of the Colorado and Rio Grande Rivers have been unearthed recently near Marble Falls, Tex., by Miss Alma Ney, an enthusiastic young explorer and archæologist of St. Louis. Traces of the existence of at least three different types of men at three different epochs in the world's history have been found there by her, and the sacred images are believed to have belonged to the latest, or about the time of the Aztecs. That these three different types of men existed is shown by the radically different types of abodes that have been unearthed in the explorations. There are some which are entirely subterranean, in ramifying burrows like enlarged rabbit warrens. Others, which were probably the homes of people of Aztec or Toltec blood, were built of sun-dried brick or roughly-dressed stone, and were fairly substantial houses. The third, which are to be found in the greatest numbers—in endless number wherever in the State there is trace of an early watercourse or pond—were built over excavations perhaps 3 feet deep. While making her explorations Miss Ney discovered what is believed to have been the palace of a king and which consisted of a mound nearly 40 feet high. On top of it were oak-trees at least 400 years old. In the mound were many broken dishes, and a number of small images believed to have been gods. They are ugly, repulsive in appearance, and rudely carved from stone. Close at hand was another mound nearly 100 feet high, believed to be a temple. In the top of it was found a room that contained a big sacrificial slab of granite, 7 feet long by 4 wide, lying across an altar 4 feet high. Near at hand lay an image of a god, hooknosed and with enormous ears. A figure representing the sun was carved on the forehead. Beside this lay a sacrificial knife of pure bronze, and there were stone bowls on the floor, supposed to have been used for catching blood. In another building was a solid gold head, believed by Miss Ney to have been intended to represent Montezuma.—*Chicago Tribune*.

STAND-PIPES IN NEW YORK TO BE UNIFORM.—The rule is to be enforced requiring that all buildings which exceed 150 feet in height be equipped with stand-pipes. Not only will pipes have to be placed in these buildings, but the couplings will have to be of the standard used by the fire-department. It is estimated that sixty per cent of the skyscrapers do not conform to this law and are in the condition of the Wells Building, at 18 Broadway, Manhattan, where when the firemen attempted to couple the hose to the outside street-connections, these were found not to be properly constructed, and the hose had to be dragged up nine floors before the firemen could operate. Another recent fire on Fifth Avenue caused the department much trouble. The description of the pipe as required by the department is as follows: These stand-pipes are to be of a quality sufficient to stand the necessary pressure (not less than 300 pounds to the square inch) to force a stream of water to any of the floors of the building or the roof, and are to extend from the cellar to the roof, with a two-way three-inch fire-department siamese connection placed on the street above the curb level, and connected to said stand-pipe. These stand-pipes are to have valves and two-and-one-half-inch outlets of the regular standard fire-department pattern and thread, and hose attached thereto on each floor; outlets and valves are to be placed as near the stairs as may be practicable, and also in basements and cellars of all such buildings. All stand-pipes, couplings, and other fire-appliances (the order further says) shall be of the regulation fire-department pattern to be approved by the chief of the fire-department, and to be kept in perfect working-order by a person who shall at least once a month make a thorough inspection of the same, and see that they are ready for immediate use by the fire-department. The fire-department has been very lenient so far with owners of buildings who have not complied with the law. In fact, it did not begin to enforce the law until last May. The plan for enforcing the law will be for the captain of each company to report on every building in his district which has not the proper stand-pipes. The owners of such buildings will be given sixty days in which to comply with the law, and then the penalties will be enforced.—*Fire and Water*.

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A NEW indictment has been found against the modern skyscraper, and we confess that the more indictments that are found the greater is our satisfaction. People are already familiar with the fact that these high buildings disturb land values inequitably, that they deprive adjacent streets of light and, to some degree, of air, that they tend to promote a congestion of foot and, to some extent, vehicular traffic in their neighborhood, that they complicate the matter of fire-protection and add to the cost of maintaining the public fire-department, that they overtax the capacity of the sewers and water-mains that serve them, that they increase the hazard of elevator travel, and, for all we know, are the cause of a variety of new diseases hitherto unknown to the human frame; in fact, we have recently seen mention of an alarming mortality in the ranks of elevator-conductors, forced to travel at speed through these draughty vertical tunnels day after day under all conditions of temperature. The new indictment we speak of is brought by Professor Hyatt, of St. Louis, a weather observer, who declares that the presence of high buildings in a city perceptibly increases the average outdoor temperature of that city, and any one who receives of an afternoon the heat-rays reflected from the walls of one of these monsters, and finds the mercury still ascending, when he clearly remembers that under similar circumstances a few years before it used to fall agreeably, can easily believe it. The cause of the phenomenon lies in the fact that these great masses of masonry become store-houses of heat, to be radiated upon suffering humanity in the night-hours, which should be cool and refreshing. There can be no question about the physical facts or that they are evil ones, and though for northern cities they may be disregarded, it really seems as if the citizens of Philadelphia, for instance, whose summer nights even now, with reasonably wide streets and low buildings, are nights of sweltering torture because of the dull and lifeless heat radiated from building and pavement, should feel urged by this fear alone to take steps to regulate the erection of high buildings, particularly in residential districts and upon narrow streets.

THE Philadelphians, long restive under the incubus of the extraordinary Public Buildings Commission, one of the most successful engines devised by a corrupt political system, are just now inclined to make one more effort to induce the Legislature to consent to abolish this most scandalous of its creations. A year ago the Municipal League, a body of public-spirited citizens, appointed a committee to take action and prepare the needful evidence and petition, but somehow or other the present Mayor, some of whose acts have been, to say the

least, devious, managed to persuade this committee not to take action, but to leave the matter in his hands, on the assurance that he knew he could accomplish the desired end without provoking an open fight with the machine-politicians, who would do anything rather than lose the "patronage," to say nothing of actual dollars, that falls to them so long as the Public Buildings Commission can perpetuate itself. Apparently, the members of the Committee and of the League itself are becoming suspicious and there is an indication that they no longer propose to wait on the Mayor's movements. Just how much more than twenty millions of dollars have nominally been expended on the Philadelphia City-hall we will not undertake to say, but it is a conservative statement to say that the building has cost the citizens more than five times as much as it should.

THE newspapers are doing their best to revive the interest in the matter of rebuilding in permanent material the naval arch in New York and, meanwhile, certain repairs are to be made in the temporary structure, so that it may safely weather the winter storms. We believe that the present apathy in connection with the raising of money for rebuilding is very largely concerned with the matter of site. It seems very plain that the citizens of New York are tired of having it where it now is: they have experienced the annoyances, perils and discomforts due to the presence of the structures in what should be an open roadway, and we do not, for a moment, believe that if a vote could be taken on leaving the structures where they are, or removing them to an indefinite elsewhere, it would result in favor of the present position. This belief seems to be gaining ground and several sites have been suggested, the most sensible and fitting of which is the approach to the new viaduct which the Park Department is to build in Riverside Park. This site, at Ninety-sixth Street, would bring the arch into the reasonable neighborhood of the interesting group of buildings on Bloomingdale Heights, and add to their spectacular attractiveness. Used to accentuate and decorate the entrance to an elevated viaduct the arch would, in this position, seem to be restored to a natural use and serve a purpose to which the Romans often devoted it.

ARCHITECTS should find the next report issued by Boston Manufacturers Mutual Fire Insurance Company of much value, as it is to contain the digested report of the experiments recently conducted by Mr. Charles L. Norton at the Massachusetts Institute of Technology as to the best method of lighting rooms by the use of ribbed or prismatic glass. For some time past this insurance company has urged its members to obtain a better, because more evenly diffused, light for their weaving and other rooms by glazing their windows with ribbed glass, and the advice has in many cases been followed with most satisfactory results. But it was thought that the mere substitution of ribbed for plain glass was a rather empirical and crude way of securing the desired effect, and that as the laws of the transmission and diffusion of light were very definitely determined, an application of these laws to the problem in hand might reveal that the same or better effects might be obtained by the use of a less quantity of the ribbed glass inserted in only a part of the window opening, and one part of Mr. Norton's duty has been to consider this possibility. If a sufficiency of diffused light can be obtained by a partial glazing with ribbed glass it is desirable to know it, for aside from the fact that ribbed glass is opaque, so far as vision is concerned, and for that reason alone it is undesirable it should wholly displace plain glass, it is almost certain that the sunlight transmitted through plain glass has a greater hygienic value than that which is refracted through the denser medium.

THE insurance companies are just now somewhat agitated by the advent of the automobile, and, naturally, the accident and life companies have been first to look into and take steps to deal effectively with this new hazard, which imperils not only the lives of those who voluntarily use the machines, but also of those who are using other vehicles and even only those means of locomotion which Nature furnishes. It appears, however, that the fire-companies are also interested in the matter, and are issuing policies on those machines which are operated by steam or vapor engines of various kinds, not a few of which have come to an untimely end on the road, when the owner,

forced to tramp home a-foot, left behind him only a tangled heap of scrap-iron. The dangers to the vehicle and its passengers are not the only ones involved, however, as shown by the recent experience of a gentleman who, returning from his ride, drove his vehicle into the carriage-house and left it there with the burner still alight under the boiler. The apparatus, being furnished with a safety-valve, regularly blew-off the surplus steam as long as any water was left in the boiler, and then, becoming red-hot, set the woodwork afire, and but for timely discovery would, in turn, have caused the destruction of the carriage-house and adjacent stables. This incident, which might so easily be repeated, should cause architects to include in their plans for stables and carriage-houses an absolutely fireproof compartment for the reception of automobiles.

ANOTHER insurance matter which has an indirect interest for architects is the definition of what is a "total loss." In this matter the Minnesota Supreme Court holds that although a building is so little injured by fire as to make it quite worth while to repair it, nevertheless an insurance company may properly be called on to pay a total loss on it under certain conditions. The loss occurred in a city where there was an ordinance which made it discretionary with the inspector of buildings whether he should or should not allow the rebuilding of a combustible structure within the fire-limits of the city, if said building had been damaged to the extent of half its value. In this case the inspector, like a prudent man, desiring to substitute for combustible buildings those more incombustible as rapidly as possible, declined to issue a permit to repair the building, and the Court, by upholding the rightfulness of the inspector's action under the ordinance, has forced the insurance company to pay a total loss on a building that could easily have been repaired. This decision seems to contravene the decision of other courts which have generally held, in consonance with the old English rule, that a loss is only total in a case where a prudent man, if uninsured, would not rebuild. It would seem as if the insurance company might successfully bring a suit for partial relief against the city for adopting such an ordinance, particularly if the date of the policy chanced to antedate the time of the passing of the ordinance.

IF any one in this neighborhood stood in need of accurate information on matters of art he was likely to turn first for help to Sylvester R. Koehler, who, if he could not give, at once and off-hand, the desired information, was ready to spend time and trouble in helping the inquirer to run the desired fact to earth. His sudden death this week will deprive students and artists alike of a modest and willing coadjutor. Born at Leipzig in 1837, and reaching this country in 1849, he is but another of the foreign-born citizens who have done so much to advance the civilization of this country. For several years he has been the curator of prints in the Boston Museum of Fine Arts and not only made the collections under his immediate charge of great value to the public by arranging special and timely exhibitions as occasion arose, but made himself one of the most valued members of the Museum's staff, and, as a consequence, he was often sent abroad on business connected with his own and other branches of the Museum. If he ever had cause to regret one thing more than another in his career it was probably the untimely demise of the *American Art Review*, twenty years ago, the most thorough and satisfactory art journal that has ever been published in this country. Unfortunately, it was in advance of its time, as there was not then a *clientèle* in this country large enough to support it, while as for foreign support, the mere idea that Americans were trying to publish such a journal was enough to excite jeers and laughter, a condition of things not likely to attract subscriptions. Besides being a frequent contributor to magazines and newspapers, Mr. Koehler translated several books on art and edited others, besides writing several original treatises on etching.

THERE are so many amateurs of art always ready to express a gratuitous opinion on matters of art, men who, somehow or other, manage to get a hearing and often succeed in expressing an opinion that one is glad to listen to or read, that the professional art critic must find his calling anything but a gainful one. But if a man can earn a living by the exercise of his critical powers and the use of his acquired information, we can conceive of no calling which should yield a more elevated or purer enjoyment. To the mere sen-

suous enjoyment of paintings, sculpture and *objets de vertu* is added the intellectual effort to discriminate between the good and the bad, to detect and reject the spurious, to know *au fond* the styles, the schools, the individual characteristics and the histories, not only of the several artists, but the connected histories of each of their several works through all the decades and centuries of their existence. There are, we fancy, few men so endowed by nature, so trained by study, so favored by opportunity, who can properly be called professional art critics, and the accidental death of John R. Randolph this week in New York, at the age of forty-two, reduces the number. His entire business career of twenty-four years was, we believe, passed in the employ of the American Art Association, and during this period he was the negotiating agent in the purchase and transfer of millions of dollars' worth of paintings. Amongst other private collections in this country which were practically created by Mr. Randolph's discriminating judgment is that of the late Collis P. Huntington, concerning the great worth and high standard of which the daily papers and art journals have recently said so much, and to him constantly resorted other millionaires when the temptation came to add to the contents of their private galleries. It is even said that one of them sought to secure the critic's services for his exclusive benefit and, besides offering a generous salary, also intimated his willingness to present him with a furnished house in his own neighborhood; but something in the idea seems to have offended Mr. Randolph's American sense of freedom and he declined the offer.

THERE is not much of similitude between the labors of a naval engineer and those of a gardener, yet the Scotch seem to have a national aptitude for the discharge of the duties of both these stations. The ship-owner who has a Scotchman for his chief-engineer is no more lucky than the man who has a Scotch gardener. The thought is suggested by the death, last week, of William Saunders, a native of St. Andrews, Scotland, and the son and grandson of gardeners. Although intended by his mother for the kirk and partly educated in the Divinity School of his native town, his inherited instincts were not to be warped from a love of the informal laws of Nature to a regard for the more rigid rules of Calvinism. After serving an apprenticeship at the Kew Gardens he came to this country, settling first at Germantown and, later, moving on to Washington, where at the time of his death he was the oldest official in the Department of Agriculture, having been Superintendent of the Division of Experimental Gardens and Grounds, a branch organized by himself, ever since 1889. Indeed much of the very valuable work done by the Department was undertaken at his suggestion or in continuance of enquiries and experiments already begun by him. Not only the grounds about the Smithsonian and Agricultural Department buildings were under his direct charge and owe their many charms to him, but, as President of the city's Park Commission, he took the greatest interest in developing the parks of the city and gave particular attention to the treatment of the small squares and "circles" that form one of the distinguishing features of the city. In the private practice of his calling as landscape gardener he, earlier in life, laid out Fairmount Park, Philadelphia, and, later, Hunting Park and the private park of Johns Hopkins in Baltimore. Amongst other of his activities may be counted the organization of the great agricultural league the Patrons of Husbandry, better known as the Grangers.

THE list of departed architects who have had part in building, altering and reconstructing the Louvre and Tuileries is a long one, and to it must be added that of Henry Jean Baptiste Dubois, who died recently at the age of seventy-eight. A pupil of Vaudoyer and twice admitted *en loge*, although he never won the coveted prize, Dubois passed the early years of his life as inspector of works for the *Chemin de Fer du Nord*, although in 1851-2 he filled the same office during the building of the galleries on the river that connect the Louvre with the Tuileries. Later he was associated with Alfred Normand in building the Grand Hôtel du Louvre, and the Grand Hôtel near the Opéra, and later still he built twelve market-houses for the *Compagnie Générale des Marchés* in different parts of Paris. Besides these he designed and built a large number of private dwellings and apartment-houses, and in 1881 the *Société Centrale des Architectes Français* awarded him its grand silver medal for private architecture.

NOTES ON SOME EUROPEAN SYSTEMS OF FOREST ADMINISTRATION.¹—VI.

RECENT SWISS FOREST LEGISLATION.



Tomb of Feyen-Perrin, Cemetery of Montmartre, Paris, France. From *La Semaine des Constructeurs*.

HAVING thus outlined, though roughly, the gradual development, in the course of centuries, of forest preservation, and glanced at the several steps by which the Swiss system grew into its modern form, it may be worth while to examine in detail some points of comparatively recent legislation in that country which embody the most important results of experience and scientific investigation.

Cantonal Forest Schools.—With the object of abating certain abuses which were found to be working disastrous consequences, the Swiss Confederation, under the Federal law of 1876, assumed superior authority over the forest police in the higher moun-

tain forests, which were organized into a reservation called the Federal forest-zone.

The difficulty of securing the requisite number of capable men to guard these forests was foreseen, and provision was made in the law for establishing Cantonal forest-schools to be aided by State subsidies, which it was hoped would be able to turn out enough men trained in the principles of practical forestry to fill the places.

The subsidies are voted upon presentation of petition, accompanied by the necessary information, including a programme of the course proposed. The course prescribed covers, in all, not more than a year, in sessions of two months' duration. The instruction given is strictly practical, with only so much theoretical study as is necessary to fit the under-foresters to understand the aim of the various operations of the administration. It comprises: surveying of forest acreage, calculation of surfaces, standing timber, stone, etc.; estimating contents and value of single stems or of parcels of forest; levelling, forest road-building, protection of the forest against avalanche and landslip; the study of the tree-species, harmful growth, etc.; an elementary study of soils, and of climatology and meteorology; the culture and maintenance of forests; the utilization, policing and protection of the forests; and, finally, some book-keeping.

The scientific features of the course are carried only far enough to fit the pupil for an intelligent discharge of his duties as under-forester.

The number of pupils to be admitted to the Cantonal forest courses is limited to thirty, and the age of entrance fixed at eighteen. The qualifying entrance examination is based upon the standard of the best primary schools, and the candidate becomes eligible for appointment to duty only after passing a rigid final test. The Cantons appoint teachers for the forestry-schools, subject to approval of the Federal Council, which reserves the right to alter the course of studies.

Federal Subsidies.—The law of 1876 provided also for subsidies to aid the Cantons in the creation of new forests and in the reforestation of the protective forests (Art. 24). Requests for subsidies must be accompanied by reports and plans showing owners, locality, commune, area, character of work proposed, sort of culture and method of execution, and probable difficulties and natural risks to be encountered. Careful estimates of cost, per hectare and in total, of the work proposed and of probable incidental defensive works, must accompany the application.

Subsidies are payable on completion of the work, in accordance with approved plans, but in special cases involving large expenditures the accounts may be audited and instalments paid before completion of the whole.

The Federal Council refuses to consider any expenditure in excess of estimated cost, and authorizes payment of subsidies only upon the certificate of the Federal Forest Inspectorate to the conformity of

work with rendered bill of costs. Federal subsidies to the Cantons to aid in the correction, canalization, etc., of torrents were also contemplated by the law of 1876. Upon the receipt of Federal subsidy the Canton becomes responsible to the Confederation for the care and protection of the replanted forests and other works, and for subsequent necessary repairs and improvements to the same.

The cost of triangulation in the Federal forest-zone is borne by the Cantons until the results are verified by the Confederation,—at the latter's expense,—when a subsidy of 20 francs "the point" is paid to the Cantons for such work done as prescribed.

Neutral Forest-zone.—A treaty was ratified between France and Switzerland in 1882, creating a neutral zone of ten kilometres—six miles—in width on either side of the frontier, within whose limits certain products are exempt from the collection of duties of import, export, or circulation. These articles are: cereals, hay, straw, green fodder, forest products, wood, charcoal, potash, seeds, plants, and animals and implements used in cultivation within the zone on either side, all under control of the regulations against fraud established by either country. Products going from the one country to a flour-mill or saw-mill in the other are exempt. Hemp, flax, etc., are free. The highways on either side are open to this traffic.

Swiss owners in France, within the zone, and *vice versa*, are accorded rights of citizenship and police protection under the laws. Guards to forest properties within the zone are appointed according to the laws of the country within which such forests lie, and are subject to its regulations. Trespass in these forest properties is punishable as in other cases, the costs being assessed against the owners, who are also responsible for the pay of the guards. Fines are turned into the treasury of the country in which the offense is committed.

Guards in pursuit of trespassers are authorized to cross the frontier and to make arrests where they can. They are not, however, allowed to enter domiciles without the participation of some local functionary, which assistance is provided for in the treaty. The names of all frontier forest-guards are registered in either country. The treaty provides for necessary modification of the laws of either country in furtherance of its objects.

Eligibility of Upper-foresters.—In 1885, the Federal Council issued instructions determining the question of eligibility to the higher Cantonal forest offices in the Federal forest-zone under the law of 1876.

Candidates for the offices of inspector, district-forester, etc., are examined in theoretical and practical forestry, and in the scientific branches covered by the diploma of the Forestry School of the Federal Polytechnic at Zürich. The holder of this diploma is exempt from further test in theory. The practical examination includes: forest estimates, silviculture, realization of yield and practical administration. The candidate must have had at least one year's practical experience. The examinations are held by a special commission composed of the Federal Inspector of Forests, as Chairman, the President of the Federal Forestry School, and a third member, nominated in each case by the Federal Department of Commerce. Forest employés of some years' standing are excused from the practical examination.

Those holding certificates of fitness from higher schools of forestry, or who have done known scientific work in this province, or who have already filled positions of like requirements, are also exempt. The Commission is empowered to determine all these points before handing in the examination-papers to the examiners.

The oral examination is the same as that for the diploma of the Forestry School.

The written examination sets two problems, two hours being allowed for each.

A third question may be given calling for a treatment more in detail, and for this a day is allowed.

The examinations are continuous and under constant surveillance. Candidates are allowed to enter the examinations of pupils qualifying for the Forestry School diploma. Tabulated results of examinations are forwarded to the School Council, and thence to the Federal Department of Commerce and Agriculture. Candidates who fail to pass are allowed to re-enter after the lapse of one year.

Each candidate pays an examination tax of 50 francs, which is turned into the treasury of the Confederation, the latter paying all costs of examination. Thus, only a candidate holding the diploma of the Federal Forestry School, or one who has passed the special examination provided for, and who has at least one year's practical experience in the business of forestry, is admissible to examination.

Satisfying these initial requirements, he is further tested with problems such as:—

(a) Survey and plan of a parcel of forest, of at least 20 hectares, in the Federal forest-zone, or in the Basses-Alpes, in accordance with the instructions of 1882 as to the detailed survey of the forests.

(b) Elaboration in detail of the management of a forest of at least 80 hectares area, with plan of same.

An oral examination in all branches of silviculture follows. There is also an oral test of the candidate's knowledge of forest legislation, and of practical forest administration on the ground. Trials on the ground occupy one day. The examination on forest legislation and administration consumes two hours. Brevets of eligibility are issued in due course upon report of the examiners.

Central Experimental Station.—In 1885, the Federal Assembly of the Confederation voted the establishment of a central station

¹ Continued from No. 1285, page 45.

of experimental forestry, to be attached to the Forestry Section of the Federal Polytechnic School of Zürich. This station is designed to furnish, by means of experiment, research and scientific observation, a definite basis for forest economics in their broadest scope, and to further the solution of important questions of forest meteorology in the more restricted relation of the term to conditions of weather and climate.

The station is run by a Commission of from five to seven members, appointed by the Federal Council, of whom three are chosen from the roster of active Cantonal foresters. The President of the Federal School-board and the Chief Federal Forest Inspector are members *ex-officio*. The others are appointed for a term of three years, with a lapse of three years before reappointment. The President of the School-board is the presiding officer of the Commission. Two meetings are held in each year, current business being determined in the interval by the President on report of the Chief of Station.

The competence of the Commission covers:—

- (a) The adoption of annual working-plans.
- (b) Estimates for the ordinary annual budget and for the extraordinary budget for initial establishment of the station.
- (The above two items referable to the Federal Council.)
- (c) Publication of results of investigation and observation.
- (d) Recommendation to Federal Council for nomination of the Director of Station and his two principal assistants.
- (e) Nomination of functionary in charge of forestry-garden and meteorological station.
- (Other employés are appointed by the Director.)
- (f) Editing the necessary instructions for the work of the station, under approval of the Federal Council of Schools.

The Director of the Central Station is a professor of the School of Forestry, appointed by the Federal Council on nomination of the Commission. He has under his command an assistant who has taken the course of forestry, and a second assistant instructed in chemistry and physiology, also the officer in charge of the forestry-garden and meteorological station, and the other necessary employés. All professors of the Forestry School are required to give such assistance as may be rendered without interfering with their regular duties. The three establishments annexed to the Forestry School, namely, that of Experiments in Agricultural Chemistry, that of Seeds and Planting, and that of Experiments in Durability of Materials of Construction, are open to the Experimental Forestry Station within the limits of their rules, and are required to aid its work as their own duties may permit.

The functions of the Director are:—

- (a) General administration of the Station.
- (b) Elaboration of working-plans for the Commission and preparation of the annual report.
- (c) Financial affairs of the Station, preparation of budget for the Commission, and the strict limitation of expenditures to the amount of the appropriation.
- (d) Communication with collaborators, with proprietors of forests and with other experimental stations.
- (e) Superintendence of works, recapitulation of the results of investigations and observation, and recommendations to the Commission of results for publication.
- (f) Nominations of assistants and other employés.
- (g) Purchase and care of instruments, tools and collections.

The Act further provides that the Department of Commerce and Agriculture shall arrange with the Cantonal Governments, and through the latter with communes and corporations, for the cession of their forests for experimental works, and for their participation in the expense of such operations. The Department also sees to the regular transmission of reports from the forest *personnel* to the Experimental Station.

The approval of meteorological observations made by the Experimental Station and the recapitulation of the results furnished devolves upon the Central Swiss Meteorological Station, the original data being returned with statement of results deduced to the Director of the Central Experimental Forestry Station for his guidance.

Federal Control of Forest Police.—The present forest administration of Switzerland is based upon the Federal law of 1876, with amendments of 1880 and 1898.

The essential feature of this law is that which establishes the superior authority of the Confederation over the forest police in all protective forests, and in all State, communal and corporation forests whether protective or otherwise.

The law itself defines the term "protective" as covering all those forests which, because of their altitude and their situation upon abrupt slopes, summits, ridges, shoulders and spurs, near sources, in defiles, in ravines, along brooks and streams, or in thinly wooded regions, serve as protection against climatic influences, storm-winds, avalanches, falling rocks and ice, sinking and slipping of the land, scouring and inundation.

The Cantons determine, subject to approval of the Federal Council, the classification of their forests as protective or non-protective. The Cantonal ordinances for carrying out this law are enforced by the Federal Government through the medium of a Federal Forest In-

spector and his proper force, appointed by the State from foresters instructed in the Cantonal forest-schools. Certain dispositions to promote preservation of the forest and certain conditions imposed upon proprietors to the same end are noteworthy.

A maximum of five years is allowed for the delimitation of forests assigned to Federal control.

Only the outer boundaries of bodies of forest made up of several parcels of different ownership need be fixed; within the defined limits no reduction of the wooded area may occur without permission of the Cantonal authorities, and the principle is laid down that all authorized cuttings and clearings must be reforested, or an equal area elsewhere in the forest-limits planted. Clearing is practically prohibited in the protective forests, or where it may cause injury to them, and no exception to this rule is made without express authority of the Federal Council. Division or alienation of proprietary rights in State, communal or corporation forests is illegal without Cantonal authority. The rights of common, of tillage, or other servitudes attaching to the protective forests, may be extinguished, when advisable, by means of indemnification in money, or the equivalent in land allotted elsewhere by Cantonal legislation, and no new servitudes may attach to the protective forests. The management and utilization of the State, communal and corporation forests are regulated according to working-plans based upon their annual productive capacity; this annual yield may not be exceeded, or the excess due to exceptional circumstances must be compensated by a reduction of the subsequent usufruct. Where the information is not at hand for the projection of a working-plan, the best method for the utilization, regeneration and culture of a forest is determined by five years of experimental management.

The Cantons are empowered to extend these methods to private forests within the scope of the law, and to institute all necessary measures of police and administration to safeguard the protective forests and realize the ends for which they are established.

Certain customary rights to use of the forest for pasture, small cultures, etc., may be regulated, suspended, if deemed hurtful, or entirely suppressed.

The Government may demand the afforestation of certain lands likely to develop important protective forests, and both Canton and Confederation will contribute to the cost of planting and protecting the same, the law providing for the expropriation of such lands where they belong to private owners.

Besides granting subsidies to the Cantonal schools of forestry, the Confederation gives subsidies for the making of new forests, and for replanting protective forests which guard certain localities from elemental damage, or which are connected with "works of defence"; also in cases where replanting involves unusual difficulties. These Federal subsidies amount to from 30 to 70 per cent of the total cost of creating a new forest, and from 20 to 50 per cent of replanting. They are paid on certificate of the Federal Forest Inspector that the work has been properly done and the costs correctly charged. In receiving the subsidies the Cantons assume an obligation to guard and maintain the improved forests.

Fines for infringement of the several articles of this law are set at from 5 to 500 francs and are imposed by the Cantonal authorities.

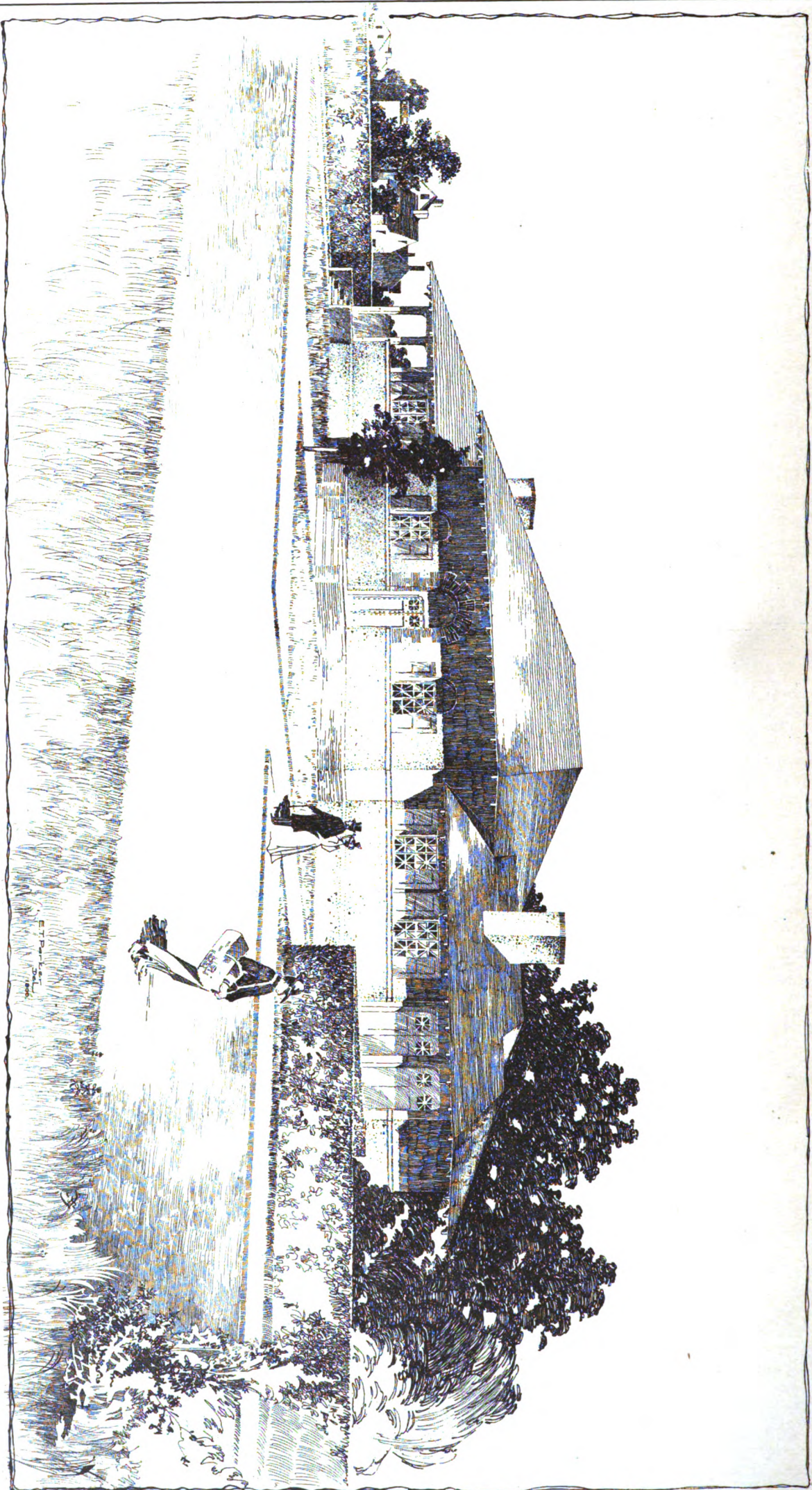
The Cantons are required to provide against trespass and fires, to repair the ravages of storms, of insects, etc., and to decree penalties.

It is provided that where landed proprietors persistently refuse to carry out improvements ordered, the latter may be completed by the Canton at the proprietor's expense. The law finally provides for the execution of its provisions, and the protection and management of the forests within its scope, by the Federal Government until the Cantons were ready to assume their several parts, the expense of such administration to be afterward assessed against the Cantons, fixing for each Canton the term of this provisional arrangement, the Confederation retaining meanwhile the right to pass in approval all Cantonal laws relating to matters of the forest.

The operation of this law soon began to convince the people of the benefits to be derived from uniformity of system and centralization of power. There grew up throughout Switzerland an ever-spreading agitation for the extension of Federal authority over the forests beyond the limits of the so-called Federal-zone. Berne, Soleure and Bâle-Campagne memorialized in 1886 for subsidies in aid of sylviculture for regions lying wholly or in part without the Federal forest-zone. In 1890 "*la Société suisse des forestiers*" called upon the Government to study the question of extension.

In 1891 "*la Société agricole de Courtelay*" and "*la Société jurassienne d'émulation*," endorsed by the Communes of Bienne, Mâretsch, Mâche, and Boujeau, asked the extension of Federal Forest administration to the Jura. A message of the Federal Council to the Federal Assembly in 1893 calls attention to the report of M. Frey, Inspector of Forests, upon conditions in the Bernese Franches-Montagnes and on the north slope of the Chasseral, where he discloses a decrease of wooded area in the previous decade and the relatively limited extent of forest in the Jura.

The report calls attention to the loss to agriculture from the drying-up of springs, and to the beneficent effects of a rich forest-covering in moderating temperature and regulating humidity, whereby the springs are fed, and water-power for the industries and other purposes secured in regularity. Wherefore the Inspector advocates the preservation of existing forest-masses even outside of the Federal-zone, the establishment of a wooded area carefully proportioned to the whole surface, especially in the upper basin of the water-courses,



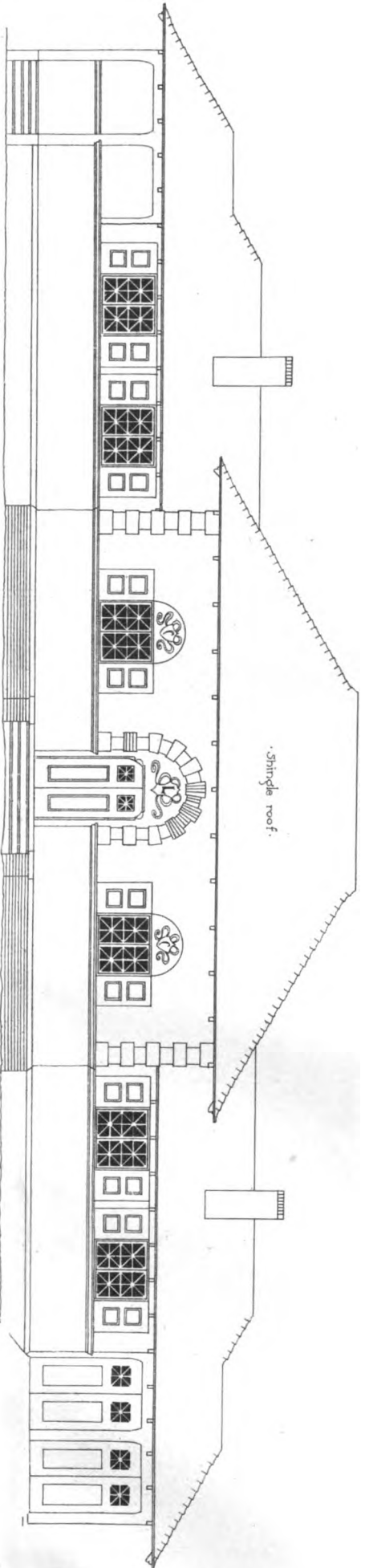
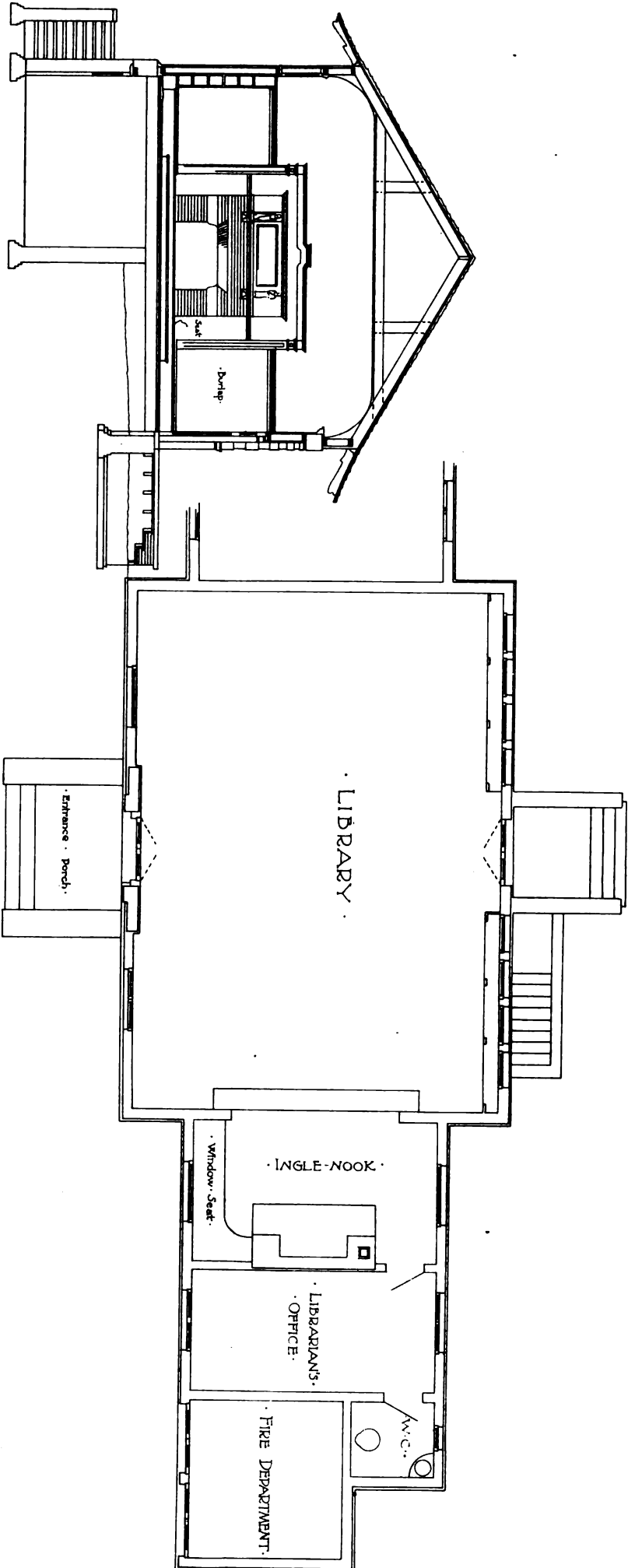
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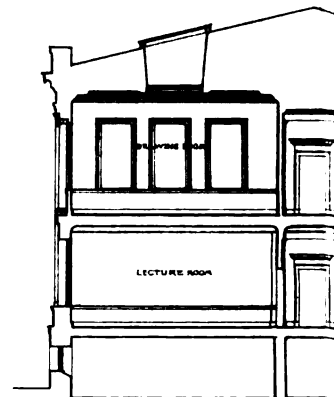
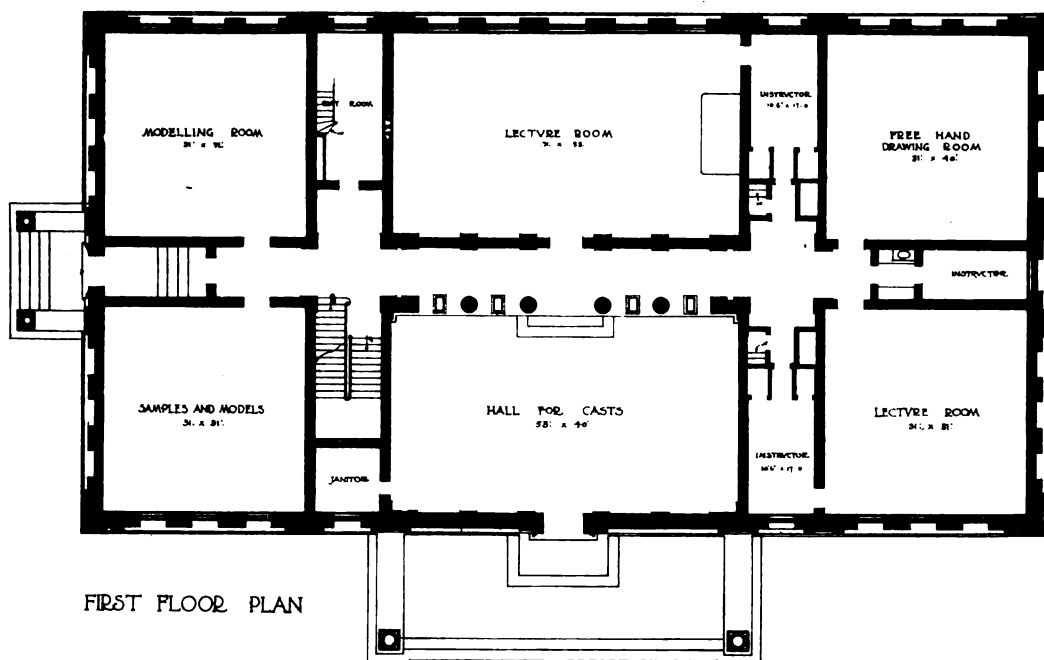
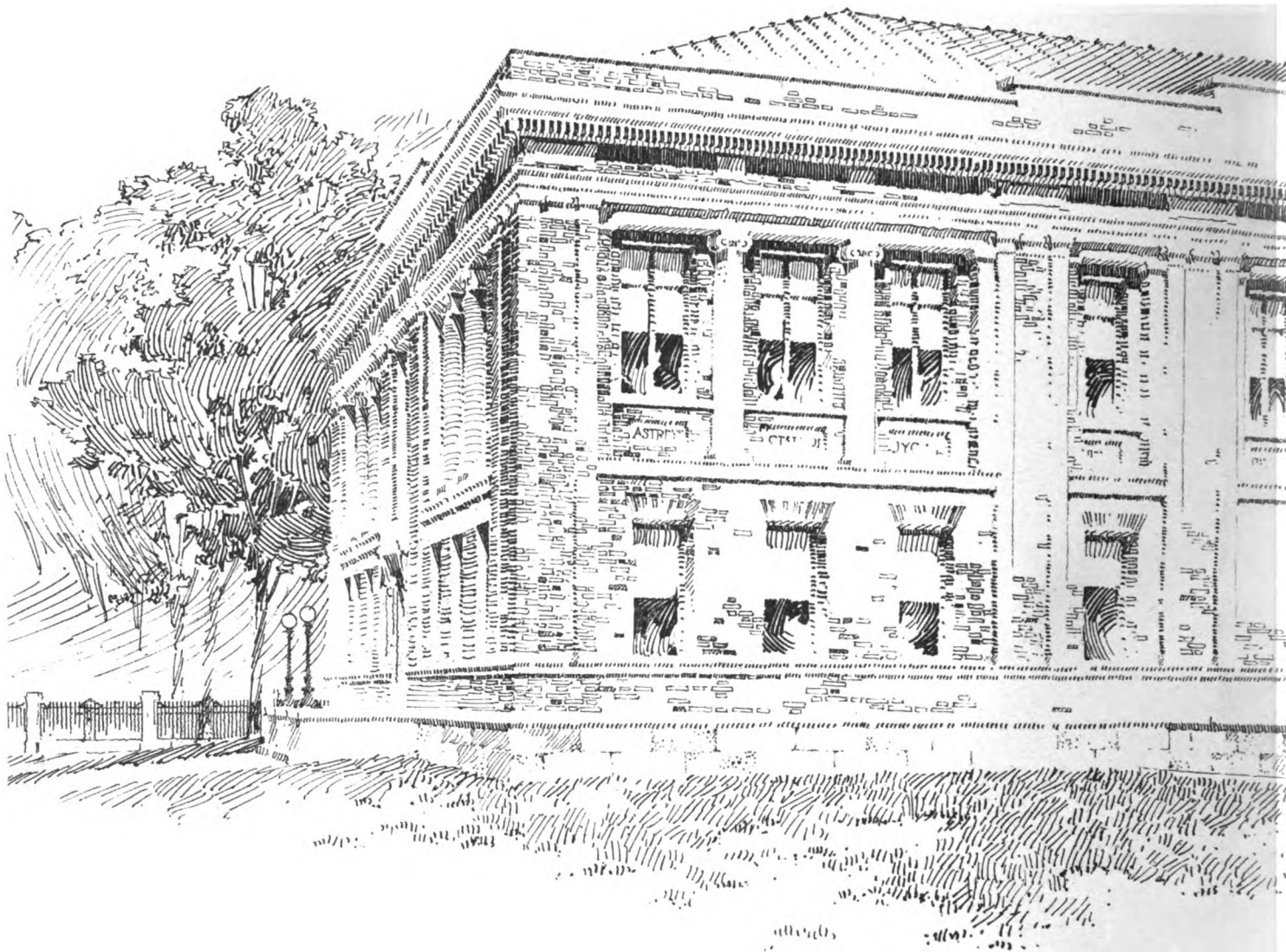
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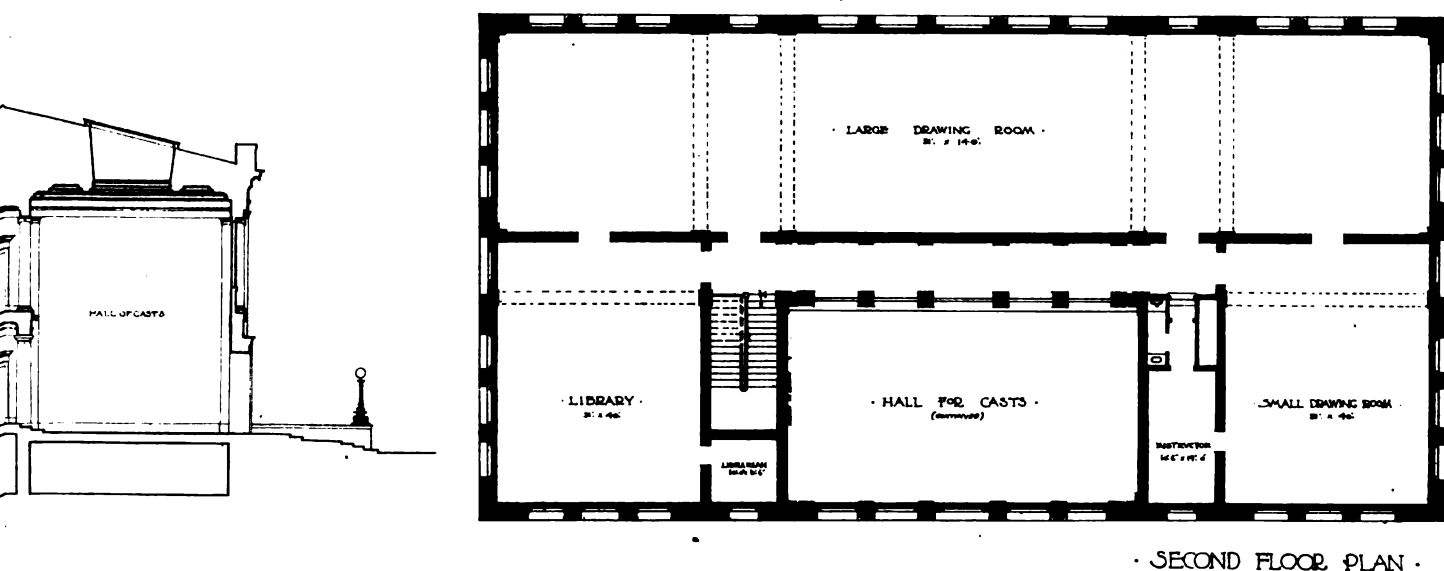
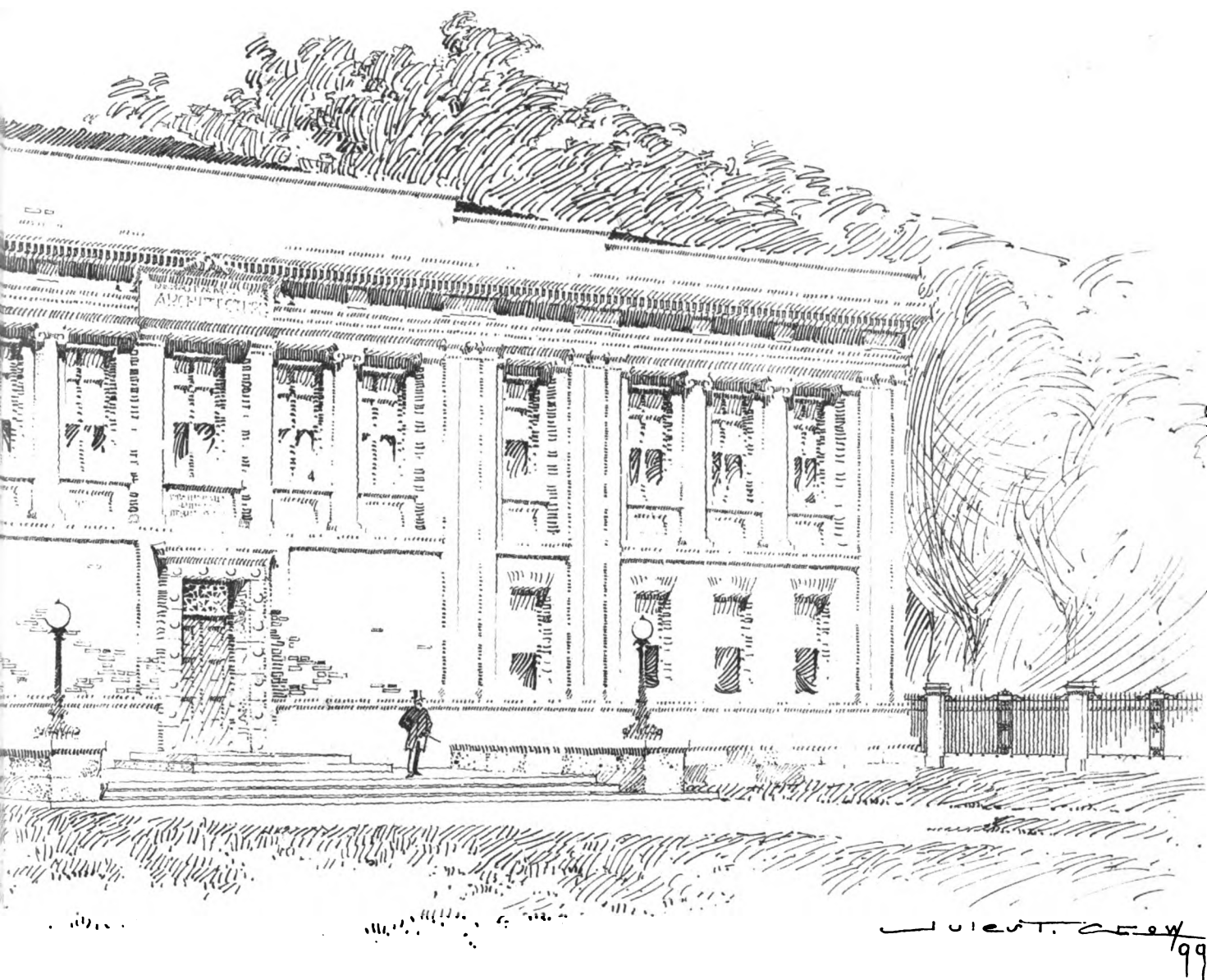
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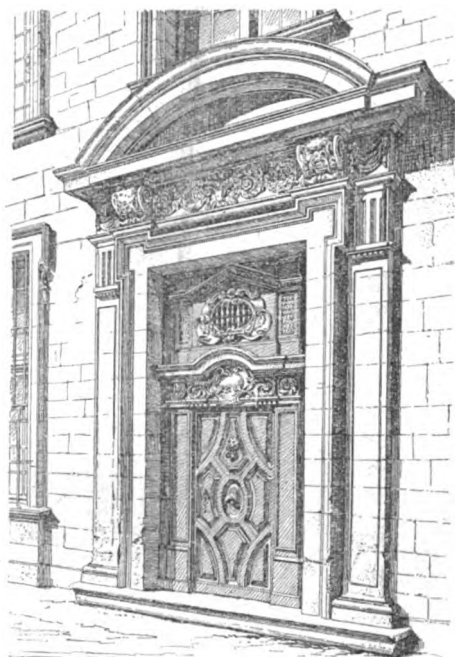
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the extinction of torrents, and, finally, better management. Numerous requests from regions outside the Federal Forest-zone for subsidies in aid of "works of defence" against the torrents and for correction and canalization of streams, are noted with the remark that, in most of these cases, the torrents have been caused by bad forestry about the sources.

Finally, the Inspector dwells upon the need of uniform forest-laws and a uniform system of forestry for all Switzerland, recapitulating the progress already effected toward this end, as follows: The establishment of a national school of sylviculture for the instruction of the higher forest officers; the establishment of the Central Experimental Forestry Station; the recognition by all the Cantons of the State diploma of eligibility to forest employment; Cantonal forest-laws which need but slight revision to bring them into harmony with a uniform system; State subsidies for instruction of under-foresters and pay of upper-foresters, for triangulation and plans, for reforestation and defensive operations.

A. B. BIBB.

LIMITATIONS OF THE RIGHT TO ANCIENT LIGHTS.



Doorway: Hotel de Luxembourg, Villeneuve-les-Avignon, France. From *La Construction Moderne*.

THE increasing degree to which light is cut off from existing buildings by the erection of higher and higher structures in their immediate neighborhood, and the frequency with which neighbors resort to the building of what are getting to be known as "spite fences" have forced the attention of property-owners and architects in this country to a closer consideration of the rights to light and air. As there seems a growing probability that our courts may presently be as much occupied in dealing with "light-and-air" cases as are the English courts, we believe it may be of practical use to print one of the latest English

decisions in an important case, and we think that if our readers will turn first to the closing paragraph they will be encouraged to turn back and read attentively the judge's opinion in full.

The judgment was given a few weeks since by Mr. Justice Wright in the important case *Warren and Others vs. Brown*, which was tried at the last Leicester assizes.

Plaintiffs were the owners of a factory at Leicester, and the defendant erected a factory on an adjoining site, which the plaintiffs alleged obstructed the light of their building. They submitted that where a person enjoyed ancient windows that the light such person was entitled to was not that light he had been accustomed to during a period of twenty years for any special business, but that which was necessary for the user of his premises in their then state, or for any purpose to which they were likely to be applied in the future. For the defendant it was argued that neither by the Prescription Act nor by the authorities was a person entitled to the whole volume of light that had come through his windows, but was limited to such an amount of light as was reasonably required for the comfortable enjoyment of life or ordinary business purposes.

Mr. Justice Wright said:—

"This case raises a question of general importance in relation to ancient lights, namely, whether the right which is acquired by statutory prescription is a right to the continuance of substantially the whole quantity of light which has come to the windows during the twenty years, or is ordinarily limited to a sufficient quantity of light for all ordinary purposes of inhabitancy or business. It seems strange that such a question should be still open for discussion, but there is a considerable body of authority in favor of either proposition.

"The facts are these: The plaintiffs, as the owners and the tenant of a building in the town of Leicester, claim damages and an injunction in respect of the obstruction of the access of light to windows more than twenty years old. At the trial the claim was limited to two rooms, one on the ground-floor and the other above the former, both facing to the south. For a length of about 17 feet in front of these rooms the defendant has raised his own building from a height of about 20½ feet to about 26 feet, but has set it back about 2 feet or 3 feet, so that the width of the street between the two buildings,

which was about 17 feet, is now about 19 feet. Four out of five windows in each of the two rooms are opposite to that part of the defendant's building which I have mentioned. These windows are large and high. Those of them which are on the ground-floor are, and for years have been, glazed with fluted glass for about half their height from the bottom. In addition to the front light both rooms receive much side light, especially from the east and east-south-east, from a wide street running north and south at a distance of about 50 feet to 70 feet. Light is not in any direction cut off by very high buildings. To the southeast the defendant has taken down a high chimney-stack, which to some extent used to intercept the light from that quarter. I find that the defendant has not obstructed or diminished to any material extent, if at all, the light coming to the upper of the two rooms in question. As regards the four windows on the ground-floor, I find that the defendant has materially diminished the light which the plaintiffs enjoyed for those windows for twenty years past, but that abundant light remains for all ordinary purposes of inhabitancy or business. The room in its present state is better lighted than the ground-floor rooms in many of the principal streets. The plaintiff Baum (the lessee of the premises) has during some years, but much less than twenty years, carried on in the premises, and particularly in the ground-floor in question, a manufacture of hosiery by means of machinery which requires a very exceptional quantity and quality of light for the continued and accurate adjustment of filaments to fine needles moving at speed in bundles of some hundreds. Before this manufacture was established at these premises a different industry (manufacture of boots and shoes) requiring good, but not special or extraordinary, light was carried on there. I find that the defendant has by the acts complained of diminished the light so that it is now materially insufficient during some part of the day for the special requirements of the plaintiff Baum's industry. I find that the plaintiffs' premises have throughout the twenty years before action been suitable for such a manufacture as that now carried on by Baum and that the kind of manufacture is and has long been common in the district, and has for twenty years past required more light than most other industries, but not until the last few years in so high a degree as at present, the older machines having been less delicate and complicated. I think that the light as it now exists would have been sufficient for any but the most recent kinds of machines. In my judgment no sufficient case for a mandatory injunction is made out in any view of the plaintiffs' rights. The inconvenience to which Baum was subjected can be, and to a great extent it has been, obviated by the removal of machines to the upper room, and in any case it can be remedied by some increased expenditure for gas. The question is whether the plaintiffs are entitled to damages. If they are, I assess the amount at £100 for the tenant and £200 for the reversioners.

"There are scarcely any authorities bearing on the question until 1865. It appears from *Aldred's case* that the nature of the cause of action in the case for infringement of rights to light was not clearly settled. It is classed with actions for nuisance, and the pleading closes with '*quod messagium horrida tenebritate obscuratum fuit*'; but a prescription is alleged. In *Luttrell's case* it is laid down that (as was afterwards established by *Yates vs. Jack* and other cases), 'if a man has an old window to his hall and afterwards he converts the hall into a parlor or any other use, yet it is not lawful for his neighbor to stop it, for he shall prescribe to have the light in such part of his house.' In 1752, in *Fishmongers' Company vs. East India Company*, Lord Hardwicke said: 'It is not sufficient to say it will alter the plaintiff's lights, for then no vacant piece of ground could be built on in the city; and here will be 17 feet distance, and the law says it must be so near as to be a nuisance. It is true the value of the plaintiff's house may be reduced by rendering the prospect less pleasant, but that is no reason to hinder a man from building on his own ground.' In *Martin vs. Goble* a malt-house with ancient windows was occupied for seven years as a poorhouse. McDonald, C. B., directed the jury that 'the house was entitled to the degree of light necessary for a malt-house, not for a dwelling-house. The converting it from one into the other could not affect the rights of the owners of the adjoining ground. No man could by any acts of his suddenly impose a new restriction upon his neighbors.' In *Attorney-General vs. Nichol*, Lord Chancellor Eldon says: 'There are many obvious cases of new buildings darkening those opposite to them, but not in such a degree that an injunction could be maintained or an action upon the case, which, however, might be maintained in many cases which would not support an injunction.' In *Back vs. Stacey*, Chief Justice Best directed the jury that in order to ground an action there must be a substantial privation of light sufficient to render the occupation of the house uncomfortable and to prevent the plaintiff from carrying on his accustomed business (that of a grocer) as beneficially as he had formerly done. In the forty years after *Back vs. Stacey* there seem to have been few or no decisions bearing on the question, but in 1865 in *Clarke vs. Clark* the question was distinctly raised for the first time. Then Lord Cranworth refused an injunction in a case in which exceptionally good light had been materially diminished, saying that the plaintiff must show such an obstruction 'as to interfere with the ordinary occupations of life.' He proceeded to draw a distinction between town and country, which has not been fully adopted in later cases. In *Durell vs. Pritchard*, and *Robson vs. Whittingham*, Lords Justices Knight, Bruce and Turner adopted the language of Lord Cranworth. In *Yates vs. Jack*, Lord Cranworth established the rule which has ever since that case

been recognized as settled, so far, at any rate, as ordinary purposes of inhabitancy or business are concerned, that the owner of ancient lights is entitled to have them protected without reference to the particular purpose for which they were enjoyed during the twenty years; and he does not apparently draw any distinction between ordinary and extraordinary purposes. In *Dent vs. Auction Mart Company*, Vice-Chancellor Wood established another rule that an injunction would not be granted in equity, unless the case is a proper one for substantial damages at law. In *Lanfranchi vs. Mackenzie*, it was held by Vice-Chancellor Malins that where ancient windows had received an extraordinary amount of light during the twenty years, and the plaintiff had used it for a purpose requiring extraordinary light (examination of silks) for only a portion of that period, he had no right to an injunction on the ground of an obstruction which left him enough light for all ordinary purposes, though not enough for extraordinary purposes. He thought, however, that if the plaintiff had been 'in the enjoyment of an extraordinary user for twenty years, that would establish the right against all persons who had reasonable knowledge of it.' In *Kelk vs. Pearson*, Lord Justice James said: 'On the part of the plaintiff it was argued before us that this was an absolute right, that now, under the statute 2 & 3 William IV., c. 71, he had an absolute and indefeasible right by way of property to the whole amount of light and air which came through the windows into his house; and that he could maintain an action at law or a suit in equity upon that absolute legal right; and the only question as to the effect or extent of his right would be with regard to the discretion of this Court in considering whether it was a case for damages, or to be interfered with by way of injunction. Now, I am of opinion that the statute has in no degree whatever altered the pre-existing law as to the nature and extent of this right. The nature and extent of the right before that statute was to have that amount of light through the windows of the house which was sufficient, according to the ordinary notions of mankind, for the comfortable use and enjoyment of that house as a dwelling-house, if it were a dwelling-house, or for the beneficial use and occupation of the house, if it were a warehouse, a shop, or other place of business. That was the extent of the easement—a right to prevent your neighbor from building upon his land so as to obstruct the access of sufficient light and air to such an extent as to render the house substantially less comfortable and enjoyable.' Lord Justice Mellish concurred, but dissented from that part of Lord Cranworth's judgment in *Clarke vs. Clark* which suggested a possible difference between town and country. In *Dickinson vs. Harbottle*, Vice-Chancellor Malins followed his own decision in *Lanfranchi vs. Mackenzie*. The question was again raised in the Court of Appeal in *City of London Brewery Company vs. Tennant*, before Lord Selborne (Lord Chancellor) and Lords Justices James and Mellish. Lord Justice James said: 'In the case of *Kelk vs. Pearson*, the Lord Justice and myself endeavored to express what we thought to be the rule applicable to these cases, and I believe the Lord Chancellor entirely agrees with the mode in which it is there expressed. We only repeated in different words what is to be found in many previous cases—that the extent of the right of an owner of ancient lights is to prevent his neighbor from building so as to obstruct the access of sufficient light and to such an extent as to render the house substantially less comfortable and enjoyable.' Lord Chancellor Selborne said, 'I agree with the judgment which Lord Justice James has delivered,' expressly adhering to the language in *Kelk vs. Pearson*, and adding that the supposed rule as to 45 degrees is no rule of law, but that if 45 degrees of light is left that is some *prima-facie* evidence of the light not being obstructed to such an extent as to call for the interference of the Court. In *Leech vs. Schweder*, Lords Justices James and Mellish held that there was no difference in extent and nature between the right acquired under the statute and a right acquired by 'the disposition of the owner of two tenements,' and that 'practically there is no difference with respect to light in the amount of damage which would entitle a person to maintain an action at law and that which would entitle him to file a bill in equity.' In *Aynsley vs. Glover* it was finally settled that the right to light for a room is not limited by the fact that before the obstruction the room was used for purposes requiring little of the light which came to it, and *Back vs. Stacey*, as amended by Vice-Chancellor Wood, is approved; but the case does not seem to contain anything affecting the present question; nor are there any criticisms on *Kelk vs. Pearson* or *City of London Brewery Company vs. Tennant*. There are no subsequent reported decisions of the Court of Appeal which are in point, and the last-mentioned decision of that Court would, as I understand it, be decisive of the matter, subject only to review in the Court of Final Appeal. This view, however, seems not to have been universally adopted, a different view having been apparently taken by the Court of Appeal in Ireland, by the whole or a majority of a Divisional Court in England, and in two or three cases by my brother Kekewich."

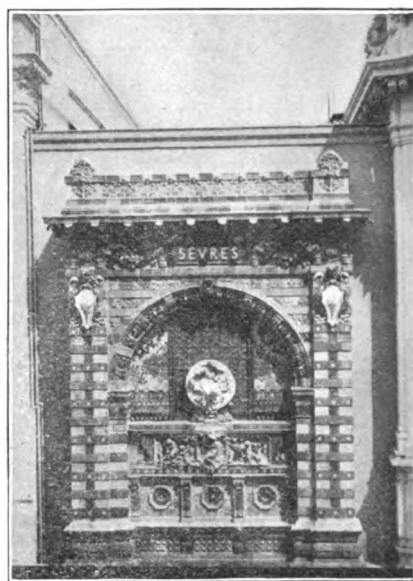
His lordship referred to *Moore vs. Hall*, in which Mr. Justice Mellor and Mr. Justice Manisty appear to have held that the plaintiff's right is to have the light flow in the same quantity as through the period of prescription; to *Mackay vs. Scottish Widows' Society*, in which Lord Justice Christian laid it down that "the right is to an average maximum of the light which nature has been shedding on the window for twenty years before the defendant interrupted it"; and to *Lazarus vs. Artistic Photographic Company*, in which Mr. Justice Kekewich held that the plaintiff was entitled to be protected

in the enjoyment of extraordinary light for photographic purposes, although he had not been using it for those or other purposes requiring extraordinary light for the full period of twenty years.

His lordship proceeded: "In this state of the authorities I think I must take it that the law is laid down in *City of London Brewery Company vs. Tennant*, agreeing, as that case does, with the criterion expressed by Lord Cranworth in *Clarke vs. Clark*, and that the plaintiffs, having an abundance of light left for all ordinary purposes of inhabitancy or business, are not entitled to relief on the ground that their extraordinary use has been interfered with. Unless, indeed, there is some such limitation of the right to light for ancient windows it is difficult, as Lord Hardwicke observed, in effect, in *Fishmongers' Company vs. East India Company*, to see how the ordinary extensions and improvements of towns could be carried on. If every house which has existed for twenty years is entitled to have all, or substantially all, the same light come to its windows as during the twenty years, no new houses could be built opposite to old ones unless at a distance which would impose on servient tenements an unreasonable burden, and might involve grave public inconveniences. Nor, if that were law, could there well be any presumption that so long as 45 degrees of light, or some approximate angle, is left there is no actionable wrong. It is not necessary in the present case to consider the question raised in *Lanfranchi vs. Mackenzie*, whether a right to an extraordinary quantity of light for extraordinary purposes can be acquired by prescription."

Judgment was therefore entered for the defendant with costs.

THE EXCAVATION OF PREHISTORIC CNOSSOS.



Detail from Projected Sevres Building: Paris Exposition. M. Risler, Architect.

AMONG the prehistoric cities of Crete Cnossos, the capital of Minos, is indicated by legend as holding the foremost place. Here the great lawgiver promulgated his famous institutions, which, like those of Moses and Numa Pompilius, were derived from a divine source; here he established a *θαλασσοκρατία*, or maritime empire, suppressing piracy, conquering the islands of the Archipelago, and imposing a tribute on subjected Athens. Here Dædalus constructed the Labyrinth, the den of the Minotaur, and fashioned the wings—perhaps the sails—with which he and Icarus took flight over the Ægean. In historic times the city waged a

protracted struggle with its neighbor, Gortyna, for the hegemony of the island. The attention of archæologists has long been directed to Cnossos; the late Dr. Schliemann was anxious to excavate the site, which was partially investigated by Mr. W. J. Stillman. The difficulties attending the prosecution of research in Crete under Turkish rule have now been removed, and it has been reserved for Mr. Arthur Evans to make a systematic exploration of the ancient stronghold, with results which equal, if they do not surpass, in importance the discoveries of Schliemann at Tiryns and Mycenæ.

Like Athens, Megara, Corinth, and other towns which played a part in Greek maritime history, Cnossos was situated at some little distance from the sea. The Akropolis, or fortified place, now excavated, lies about four miles southeast of Candia, which, under the name Heraklion, was the seaport of the town in Classical times. The palace stands on a slight eminence, overlooking a brook and surrounded by an amphitheatre of hills, over which the ancient city apparently extended. Its site was marked by a wall of Cyclopean masonry, the only vestige of the structure remaining above the surface. A considerable portion of the building has now been brought to light. The entrance, which is approached from a paved court on the eastern side, is flanked by two columns, and leads into a large ante-chamber furnished with stone benches. Hence we pass into a singularly interesting apartment, which, adopting the system of nomenclature initiated by Dr. Schliemann, we may designate the "council-chamber of Minos." Against the wall on the right stands a throne of gypsum—the oldest throne in Europe by about 2,000 years—with a low seat and a tall, curiously carved back, which still shows traces of painting. Along the walls on either side are continuous stone benches like the seats in an old-fashioned family pew: on the opposite side, protected by a high parapet to which seats are also attached, is an oblong rectangular depression, constructed with finely compacted slabs and evidently intended to contain water. This was probably a kind of ornamental *impluvium*, open to the sky;

it is approached by gradually descending steps, but no outlet for the water is visible. The walls of the council-chamber are ornamented with frescos, still sufficiently preserved to enable us to distinguish landscapes, flowing water, and flowering plants; on either side of a door leading into a smaller apartment are two griffins seated on baskets and apparently engaged in hatching.

On the southwest side of the palace we find another and larger paved area leading to what appears to have been the principal portal of the structure, as distinguished from the royal entrance on the eastern front. We enter a long corridor, on each side of which are a series of frescos representing male and female figures arrayed in rich costumes. Unfortunately in many cases only the lower parts of the bodies have been preserved, but a large fallen piece shows the figures of two men to above the waist, draped in long, flowing mantles. On the left side, the central figure is a lady, distinguished from the rest by her wide flounces, and evidently a queen. In a room near the northeast corner were found parts of a fresco in an entirely new miniature style, showing groups of elaborately dressed young women, seated in what seems to have been the *haremlik* of the palace and engaged in animated conversation. Most interesting of all is the well-preserved form of a graceful youth or maiden — it is not easy to determine the sex — holding aloft a tall, slender vase, and apparently walking in a sacrificial procession. The color is still wonderfully fresh, and the outlines are clear and well drawn. A strange fascination is attached to this beautiful life-like figure, this visitant from a long-forgotten world, recalled to the light of day and the gaze of mankind from a night of three thousand years.

On the same side of the palace are also the royal magazines or store-rooms, approached by a long corridor which leads to a succession of twelve apartments. In many of these stand rows of enormous oil vases five feet in height, some highly ornate and furnished with numerous small handles through which ropes or bands were possibly drawn; one has a pair of handles on the inside, perhaps intended for the insertion of a strap to counteract the pressure when the vessel was full. Beneath the floors of some of the chambers and passages are curious receptacles of closely fitted stonework, one above the other, apparently designed for the concealment of treasures or the storage of supplies in case of a siege.

But of all the discoveries hitherto made in the course of the excavations the most important is that of the prehistoric Cretan script, by which the long-debated question of the existence of writing in the Mycenaean age has been definitely solved. A series of signs, both of the linear and of the pictographic class, had already been observed on early Cretan seal-stones and other objects which suggested the conclusion that a regular system of writing was in use among the prehistoric Cretans. A number of clay tablets have now been brought to light bearing inscriptions in the indigenous linear character, and upwards of a thousand examples have been secured. These tablets, which were found at various times during the excavations, are in all probability palace archives or lists of stores and munitions of war in the royal arsenal; some of them are illustrated with representations of chariots and horses' heads. Within the last few days of the operations a new discovery of extraordinary interest was made. A deposit of clay bars and perforated tablets was unearthed inscribed with pictographic characters resembling the Egyptian hieroglyphics and corresponding with those already found on the early Cretan seals. Thus we obtain conclusive evidence that two distinct systems of writing — the linear and the pictographic — were employed in the island during the Homeric age.

It is impossible to describe at present more than a few of the other interesting objects found in the course of the excavations. Numerous remnants of the "Stone Age," obsidian tools, and specimens of early rude pottery have been discovered, some at the lowest levels, others in the immediate vicinity of the walls, having apparently been dug up when the foundations of the Mycenaean buildings were being laid. These indicate the existence of a still earlier city on the same site. A vast amount of pottery of the Mycenaean and geometric types has been obtained, together with specimens of the peculiar Cretan ware of which the cave at Kamáres has hitherto supplied the best examples. Among the numerous handsome stone vases are several of the graceful tapering form depicted in the fresco already described. A remarkably life-like head of a Molossian hound, executed in the finest white marble, some floriated mouldings, very delicately carved, and a beautiful clay ewer with spiral ornamentation may also be specially noticed. The crowning discovery, however, was made in the last few days of the excavations, when the remains of a painted stucco bull, a marvellously realistic work, were brought to light in the northeast propylæa. The head, which is fortunately in perfect preservation, is unquestionably the most remarkable specimen of Mycenaean plastic art as yet discovered. Here we have, perhaps, the effigy of the beautiful animal which won the heart of Pasiphaë, or of the equally famous quadruped that transported Europa to Crete.

The excavations, in which Mr. D. G. Hogarth and Mr. Mackenzie, of the British School at Athens, have been associated with Mr. Evans, have been brought to a close for the present season, but will be resumed next year, when it is hoped that sufficient funds will be forthcoming for their successful prosecution. — *Athens Correspondence London Times.*

ILLUSTRATIONS

[Contributors of drawings are requested to send also plans and a full and adequate description of the buildings, including a statement of cost.]

HOUSE OF CHARLES H. COSTER, ESQ., TUXEDO PARK, N. Y. MR. W. A. BATES, ARCHITECT, NEW YORK, N. Y.

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SQUARE TOWER WINDOWS IN EAST ANGLIA.

This plate is copied from *The Builder*.

[Additional Illustrations in the International Edition.]

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NOTES AND CLIPPINGS

NOLLEKENS IN WESTMINSTER ABBEY. — While Nollekens was examining in Westminster Abbey the site for the sumptuous monument of the three commanders who fell in Rodney's battle, Smith accompanied him. The sculptor was fortunate in a pupil who modelled and stood for models of gods as well as men, ran errands, soothed difficult customers, made ribbon garlands for the neck of his mistress's dog, attended his master on all excursions of pleasure or of art, and, finally, when the grave had closed over him and his will was read, lifted the pen and filled more than a volume with anecdotes of him and his wife, his boy Tom, his maid Bronze, and his dogs Favorite and Daphne. With this pupil by his side, and his thoughts on the future monument, the sculptor addressed himself to all who approached him. Catling, a verger, came, and the following curious conversation ensued: "Nollekens: Why, Catling, you seem to be as fond of the Abbey as I am of my models by Michel Angelo. Pray why do you suffer the schoolboys to chalk the stones so? I have been spelling pudding, grease, lard, butter, kitchen-stuff, and I don't know what else. Catling: Why, thereby hangs a tale. You must know that the Dean married a woman — here one of the clergymen appeared, and the conversation took a different turn. Nollekens: My wife bid me ask you where the Cottonian Manuscripts are kept. Catling: In Ashburnham House, Little Dean's Yard; it has a stone entrance, designed by Inigo Jones, and Dr. Bell lives there, who was chaplain to the Princess Amelia. Nollekens: Ah! I know; he was robbed by Sixteen String Jack in Gunnersbury Lane. Well, my wife wants also to know what you have done with the wooden figures in wax masks, all in tattered silk, which the Westminster boys called the ragged regiment — she says they were borne before the corpse formerly. Catling: They are put up in those very narrow closets, between our wax figures of Queen Elizabeth and Lord Chatham, in Islip's Chapel, where you have seen the stained-glass of a boy slipping down a tree and the eye slipping out of its socket. Nollekens: What, where the poll parrot is? I wonder you keep such stuff. I don't mind going to Mrs. Salmon's waxwork, where

Mother Shipton kicks you as you go out. You should not have such rubbish in the Abbey — and then to take money for this foolish thing and the other foolish thing, so that no one can look at the works of art without being bothered about Queen Catherine's bones, the Spanish ambassador's coffin, the lady who died by pricking her finger, and then the begging-cap called General Monk's, that people must put money into. You had better bid the Dean see that his monuments don't want dusting — and look after the Westminster boys and not let them break the ornaments off to play at scone within the cloisters. Now, at Rome and all other churches abroad an artist may go in and draw, but here he must apply and wait, and then be brought up like a criminal before the Dean. Stothard, the Academician, had much trouble with the man, and was talked to about the proper fees. Bless my heart, it is all very bad." During this conversation Gayfere, the Abbey mason, a worthy and clever man, came up and said, "Ah! Mr. Nollekens, and you are here? Nollekens: Here, yes. Why do you suffer that Queen Anne's altar to remain here in a Gothic building? Send it back to Whitehall, whence it came. And why don't you hinder the Westminster boys from breaking off noses and fingers from the statues? Gayfere: What an ungrateful little man you are — don't it give you a job now and then? Did not Mr. Dolben have a new nose put upon Camden's face the other day at his own expense? Nollekens: What have you done with the old Gothic pulpit? Catling: It has been conveyed to our vestry, the chapel of Saint Blaize, a curious part of the Abbey, and very dark. There is an ancient picture on the east wall of a figure which can be made tolerably out. Did you ever notice the remaining colors of the curious little figure painted on the tomb of Chaucer? Nollekens: No, that's not at all in my way." Here a Mr. Champneys joined them, and said, "Mr. Nollekens, can you tell me the name of the sculptor who executed the bas-relief of Townsend's monument? The composition and style of carving are admirable, but I am sorry to see that some base person has stolen one of the heads. Nollekens: That's what I was talking about; Dean Horsley should look after the monuments himself — hang his waxworks. Yes, I can tell you who did it — Tom Carter had the job, and one Eckstiene modelled the tablet part — it is very clever. I don't know what else he has done besides. Bartholomew Cheney modelled and carved the figures of Fame and Britannia for Captain Cornwall's monument. Sir Robert Taylor paid him four pounds fifteen shillings a week." — *The Architect*.

NATURAL COKE-OVENS. — Both in America and Europe numerous deposits of coke, made in Nature's furnace and of better quality than the artificial, have been discovered. Such have been formed by molten lava bursting through coal-beds. The process of conversion into coke under such circumstances is called by scientists "contact metamorphosis." One of the best-known deposits of this nature is that at Fünfkirchen, in Hungary, where the coal-bed was not only penetrated, but also largely flooded over by the lava, which actually also insinuated itself into the coal-strata. In some places pieces of coal are found intact, imbedded in the lava. Similarly, fragments of lava are met with imbedded in the coal. As a rule, however, wherever the lava had come in contact with the coal the latter was changed into coke. Recently in Mexico large coke-deposits have been discovered which bear a striking resemblance to that described. The coal-fields of Santa Clara have suffered extensively from the breaking through of lava. In the clefts are sand and stone imbedded. The volcanic stone forms a thin covering over the coke. Here, too, pieces of lava are sometimes found in the centre of a coal-mass and *vice versa*. The first discovery was of a comparatively useless layer of mixed coke and lava, but later a good coke-bed of from 7 to 10 feet thick was found, safely packed in beneath a thin covering of lava, but not mixed therewith. It is usually soft coal which has thus been turned to coke, but occasionally a bed of anthracite coke of about 3 feet thick is met with. Such a deposit is generally betrayed by a glassy lava covering. Occasionally in the same bed there are alternate pockets of coal and coke, separated only by a clay layer of a few inches thick. Natural coke is of a dark gray color, of fine composition — much closer than oven coke. It is no more difficult to light than is anthracite coal, and therefore furnishes an excellent fuel, which when burned up leaves only a very small amount of white ashes. — *Boston Transcript*.

CARNOT'S FATEFUL STATUETTE. — A highly curious anecdote has just been made public relating to a mysterious and maleficent statuette which would seem to have exercised a strange and baneful influence on the destiny of the late President Carnot. At the time when M. Sadi Carnot was Minister of Finance, and before there was any question of his election to the Presidency, his intimate friend, Dr. Gustave Le Bon, the well-known sociologist and traveller, offered to make him a present of a statuette he had brought back from one of his many journeys to India. When making the offer, Dr. Le Bon was careful to acquaint M. Carnot with the circumstances in which the statuette had come into his possession, and with the legend which attached to it. It had been given him by a rajah, who was most thankful to get rid of it for good and all by presenting it to a foreigner about to leave the country. The rajah explained that, according to a legend in which he firmly believed, the owner of the statuette, however humble his origin, was certain to become the principal personage in his country, but was equally certain to die a violent death. M. Carnot made light of this typically Eastern story, and had no hesitation in accepting the present. When most unexpectedly he was elected President, Dr. Le Bon received a brief and playful note from Mme. Carnot, saying that it was the statuette that had worked a miracle. Seven years later President Carnot was struck down by Caesario, and the mysterious and terrible legend had thus come true in every particular. Mme. Carnot was so impressed by these inexplicable coincidences that in her will she solemnly adjured her family to rid themselves of the fateful statuette. The truth of this anecdote is vouched for in every particular by unimpeachable witnesses, and it is certainly as strange a story of the uncanny as it is easy to recall. — *Paris Correspondence Pall Mall Gazette*.

RUSKIN AND POETS' CORNER. — The protest of certain friends of Ruskin against the erection of a memorial to him in the Poets' Corner appears ill-advised. They assume that Ruskin, having remarked "the incoherent fillings of the aisles at Westminster" and "costly obelisks and sculptures of sorrow, which spoil half of our most beautiful cathedrals," is himself on record against a memorial in the Abbey. It appears that they have been more nice in the matter than Ruskin was himself, for a member of the Committee quotes from Ruskin's "Oxford Museum": "There is no man of worth or heart (he writes in 1859, when suggesting decoration for the Oxford Museum) who would not feel it a high and priceless reward that his statue should be placed where it might remind the youth of England of what had been exemplary in his life or useful in his labors, and might be regarded with no empty reverence, no fruitless pensiveness, but with the emulative, eager, unstinted passionateness of honor which youth pays to the dead leaders of the cause it loves, or discoverers of the light by which it lives. To be buried under weight of marble, or with splendor of ceremonial, is still no more than burial; but to be remembered daily with profitable tenderness by the activist intelligences of the nation we have served, and to have power granted even to the shadows of the poor features, sunk into dust, still to warn, to animate, to command, as the father's brow rules and exalts the toil of his children — this is not burial, but immortality. The family respected Ruskin's wishes in refusing burial in the Abbey; his friends and the public have his own warrant for commemorating him in the British Walhalla." — *Exchange*.

WESTMINSTER ABBEY AS A BURIAL-PLACE FOR MODERNS. — The discussion excited by the opposition of a few of the personal friends of the late John Ruskin to the erection of a suitable memorial to the great critic in Westminster Abbey, on the ground that he himself would have objected to it, as a profanation of the venerable national shrine, has been conducted and maintained with considerable vigor and some asperity, in the London press. It is not probable, however, that any attention will be paid to the protest. Mr. Frederic Harrison, in a public letter, points out that a committee which includes the President of the Royal Academy, members of Mr. Ruskin's own family, and the supervising architect of the Abbey is not likely to consent to any design which would deface the famous church, even if the selected sculptor, Mr. Onslow Ford, were capable of suggesting it. He then goes on to say that inasmuch as the wish of Mr. Ruskin to be buried at Coniston has been fulfilled, there can be no harm in following historical precedent, and paying him the tribute of honor conferred upon other great men even at the cost of disregarding one of his prejudices. Mr. Harrison concludes as follows: "This discussion will be useful if it again reminds the nation that its sacred burial-place is now absolutely full. Not a foot of ground remains for burial, not a square yard of space for a memorial, such as the nation would desire to have in the future. Unless our breed of great men is exhausted (and I for one do not deny this), or unless the nation has ceased to honor any great men it may have, some expansion or annex to the Abbey is a necessity of our age. Our committee, with the architect, searched every available corner and barely found a free square yard." — *N. Y. Evening Post*.

"BIG BEN." — Since the close of the session and the departure of Members of Parliament for the moors and the mountains, the precincts of Westminster Palace have presented an unusually deserted and disconsolate appearance. Even "Big Ben," high up in the Clock Tower, has been showing symptoms of late that he requires a holiday quite as much as legislators, whose daily actions he helps to regulate. The great clock, which is said to be one of the best timekeepers in the world, has been stopped for some days by order of Her Majesty's Office of Works. It has been a little erratic in its movements recently, and has taken to striking wrongly and committing other irregularities, so that the authorities (says the London correspondent of the *Scotsman*) have found it necessary to thoroughly overhaul the mechanism of this gigantic horologe. "Big Ben's" temporary silence is in the nature of a public loss, for the sonorous sound of the great bell chiming the hours can be distinctly heard, when the wind is favorable, for a radius of 4 miles. This is the more remarkable owing to the fact, which is not generally known, that "Big Ben" has been cracked for many years. There is an interesting history connected with the great bell. Named after Sir Benjamin Hall, who was the First Commissioner of Works when the order for the clock was given, "Big Ben" was cast in 1856 at Norton, near Stockton-on-Tees. It weighed 16 tons, and cost £3,343. Its shipment to the Thames was a serious undertaking, and once or twice during the voyage it was feared that the weight of the enormous bell would send the vessel bearing it to the bottom of the sea. Shortly after the bell had been placed in a temporary position at Westminster, and while it was being rung at one o'clock on a Saturday, according to the custom at that period, it was noticed that it had a cracked, uncertain sound. A minute examination revealed a crack extending from the rim of the bell about half-way up the side. This discovery raised the question as to who should pay for the recasting. The founders repudiated all responsibility, declaring that the clapper, which weighed 12 cwt., was too heavy. How the dispute was settled it is not necessary to say, but the authorities placed it on record that the casting was defective. "Big Ben" was eventually broken up and recast at a cost of £750. Its weight when completed was 13 tons 10 cwt., its diameter 9 feet, and its height outside 7½ feet. The new bell was rung for the first time on November 18, 1858, but in less than a year afterwards it ceased to strike the hours, and on examination a crack 3 inches in extent was discovered on the inside. For the next three years the hours were struck on the largest of the quarter bells, but ultimately the use of the great bell was restored, the defect being practically overcome by the simple method of turning the bell round so as to present a fresh surface for the hammer or clapper to strike on. Thus for nearly forty years "Big Ben" has been ringing out the hours, day and night, without giving the slightest indication to the public of any inherent imperfection in its constitution.

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THE New York *Commercial Advertiser* makes some judicious remarks on the evil effect on values of real estate of the overbuilding which has been so common in and around all our cities for several years. Theoretically, building keeps pace with the demand, and houses are generally supposed to be built with the idea that they will be sold, or profitably rented, soon after their completion. In practice, however, the circumstances have been, of late years, very different, and thousands of houses are erected without any regard to the probability of their being occupied, the builder looking for his profit entirely to the advances that he can secure on mortgage. If savings-banks and trustees were as careful as they should be, they would not lend money to a hazardous extent on property which was likely to be unsalable or unrentable, but both trustees and savings-bank directors frequently dislike to take much trouble about other people's affairs, and have, besides, matters of their own to attend to, and they leave the examination of the property to some irresponsible lawyer or mechanic, who is, as the *Commercial Advertiser* thinks, often in collusion with the speculator, under an agreement to share with him the profits of the operation. The *Commercial Advertiser* thinks that, in some cases, the savings-bank officials receive a portion of the profit which the speculator makes out of this misuse of the depositors' money, but this supposition is hardly needed to account for bad investments which may just as well be due to carelessness and incompetence.

HONEST people, who try to borrow money on real-estate mortgage, and find that savings-bank officials and trustees of estates will not lend them more than sixty-five per cent of the assessed valuation of their property, generally have difficulty in understanding how a speculating builder can get any profit out of savings-bank loans on property which is obviously of inferior quality; and it may be interesting to them, as well as to savings-bank depositors, to know something of the methods employed. In the first place, the value of the property is usually grossly misrepresented in the application for a loan. We heard once of a man in Massachusetts who paid seven thousand dollars for an estate, and mortgaged it immediately afterwards to a savings-bank for forty thousand. The estate was at one end of the State, and the savings-bank at the other, and the officials of the latter evidently thought that it was too much trouble to inquire into the real value of the property, and took the owner's word for it. Even supposing that the bank officials or trustees ascertain the assessors' valuation of the land on which a building-loan is desired, they are not quite safe, for there are ways of temporarily increasing the assessor's valuation for the purpose of deceiving mortgagees, but, supposing that the loan is based on an honest valuation of the land, and a fair estimate of the cost of building in accordance with the plans presented by the speculator or his confederate, an ample field is still left for profitable fraud. Very

frequently, the first step is to change the plans, or substitute new ones, providing for a building very inferior in cost to that represented to the money-lender as the one which was to be a part of his security. As savings-bank directors are rarely paid enough, in their opinion, to justify any one in expecting them to run about examining their mortgage securities after the loans are approved, and trustees feel themselves even less called upon for such service, the chances are that the changes in the plans are not noticed by any one who has an interest in preventing them, and the proportion of the loan to the value of the security is thus materially altered, to the advantage of the speculator. When building is fairly begun, a few payments are usually made, out of the mortgage money, to the most importunate and wary of the mechanics, but the others, while liberally compensated in promises, receive little or no cash. Meanwhile, transfers and conveyances of the equity are quietly made, in such a way as to make it difficult to trace the ownership; and when the mechanics and material men at last become desperate, and attempt to file liens or attachments, they find it almost impossible to ascertain the name of the owner against whom the lien should be filed; or, if the name of the proper record owner is discovered, it proves to be a fictitious one, or to belong to some one who lives in a distant State, or has recently left his recorded residence for parts unknown, or is otherwise beyond the reach of creditors. Of course, the speculator's interest is to have the building carried on as far as possible on credit, so that he can get all the advances possible from the mortgagees before the final crash, but it frequently happens that the work comes to a stop before its completion. Then, the speculator, who has, of course, placed the money which he has received where his creditors cannot reach it, turns his attention to new schemes, while the mortgagees and the mechanics devote themselves to considering how the property for which they have paid so dearly can be completed, so as to be salable or rentable. In many cases the contractors assume the mortgage, and finish the building, to save themselves from further loss, but, in perhaps the majority of instances, the mortgagees foreclose, cutting off all subsequent liens, and complete the building themselves, as best they can. As, under the law, savings-banks cannot hold foreclosed property permanently, but must usually sell it within two or three years, they then hasten to offer it at a sacrifice, to the obvious injury of all the honest real-estate owners and builders in the neighborhood. Of late years these practices have grown to such proportions as to affect real-estate seriously in and about all our large cities, and it may be hoped that the New York real-estate brokers will not be alone in calling attention to the evil, and concerting means to remedy it.

IN the discussion following the settlement of the Chicago building-trades' strikes, the architects have taken a creditable part. Although, as between masters and men, they are, naturally, neutral, they have ample opportunity for studying the effect of the walking-delegate system on the economy and efficiency of building-operations, and, knowing the strictness with which building contracts are enforced, they can appreciate the distress into which the most honest and well-disposed builders are often plunged, without fault of their own, to promote the personal or political ends of the labor agitators. At the same time, no one has a higher appreciation of intelligence and skill on the part of individual workmen, and many an architect cherishes a sincere regard for some journeyman mason or carpenter who has carried out his ideas with special intelligence and faithfulness. This being so, the architects would seem to be well fitted to mediate in disputes between two parties, both of whom could be sure of their intelligent sympathy; and the fact that they are rarely called upon for such mediation indicates the flimsiness of the pretences on which the so-called "labor struggles" are generally based. In the building-trades, at least, as was shown in Chicago, the "grievances" put forward by the men as a pretext for a strike are usually either utterly ridiculous, or such as could be adjusted in ten minutes by a disinterested arbitrator; but the very absurdity of the claims made is often carefully calculated, so as to make an adjustment of them impossible, and give a pretext for prolonging a contest brought about solely to give a few selfish individuals an opportunity to profit at the expense of those who trust them. Every one must have observed, in

reading accounts of strikes, that the most conspicuous individuals concerned in managing them are usually Irish; and the student of history, knowing how cruelly the generous and faithful Irish people have, for a century or more, been exploited by heartless and treacherous plotters of their own race, finds little difficulty in recognizing, in the manœuvres which build up political influence on the sorrows of starving women and children, much of the baseness which, in the old country, has so often betrayed comrades to death in return for money or personal safety.

IT would not be possible, and it would be very undesirable, to object to the Irish leadership in such matters which the affectionate fidelity of the race does so much to facilitate; but it is quite possible to avoid using the public authority to throw such leadership into the worst hands, instead of the best. To take a single example: some years ago, a man who claimed extraordinary, and, as it turned out, fictitious influence among working-people, exhibited himself to the public as the principal personage in a great railway strike. In this strike millions of dollars' worth of railway property was destroyed, several men were murdered while doing their duty faithfully, trains full of innocent people were stopped, and more than one attempt was made to accomplish wholesale massacre, by throwing trains off the track. The prominent individual in question was seriously suspected of complicity in these crimes, which, if he had possessed the influence which he claimed, he could at least have prevented, and there was evidence which indicated that an attempt was made, previous to the strike, to extort from the railway companies shares of stock to the credit of individual "champions of labor," and that it was not until these attempts had failed that the "grievances" of the railway operatives became too intolerable to be borne; yet, instead of investigating the charges, and dealing with any person found guilty under them as an enemy to the human race, the brother, if we recollect rightly, of the person claiming to be the principal actor in the strike was, as soon as the agitation was over, appointed by the President of the United States to an important office. It is hardly necessary to say that the lesson was not lost on other plotters and mischief-makers, and positions which offer money in return for selling-out one's constituents, and public office as a reward for inciting them to deeds of violence, are eagerly sought by the worst class of adventurers. How long this will last it is impossible to say, but it is certain that nothing in the shape of provisions for arbitration or conciliation will ever be acceptable to men of this kind, and that, until their influence is reduced by the withdrawal of the support, either direct or indirect, of State and municipal governments, it is useless to expect any rational treatment of labor troubles.

ALTHOUGH we predicted, last winter, that the high prices of building-materials would not last long, the decline has come even more quickly than we expected, and has been greater, we imagine, than any one anticipated. As usual, however, the busy public, which was slow to appreciate the violent rise of last year, is equally slow in finding out that prices have fallen back, nearly or quite to the point from which they started, and we imagine that, for a time, occasional concessions will be secured, even from present rates, from dealers and manufacturers whose business has suffered from the recent fluctuations, and who find themselves obliged to make sacrifices. There is, however, no reason for considering the present prices of staple building-materials exorbitant, and, when the bargains and bankrupt stocks are disposed of, the market seems likely to remain nearly steady for many months to come. This is, of course, the best condition for building operations, and, with the elections over, and political conditions settled for four years, it seems probable that the next season will be a busy one in the building world.

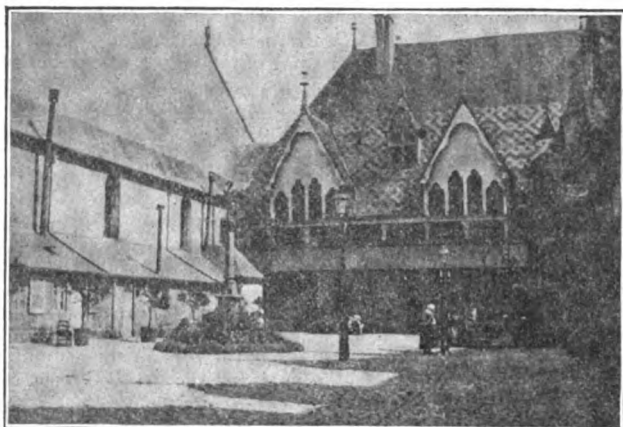
THE newspapers say that an increase in the rates of insurance on plate-glass may soon be looked for, as a result of the recent conference between the managers of the various plate-glass insurance companies. As the price of plate-glass has more than doubled within a year or so, and the rate of insurance, which is tolerably high in any case, is based on the value of the glass, the owner of a modern mercantile building is likely to find his plate-glass a rather expensive investment, especially as, in the course of the tariff changes which seem likely to be made, a reduction in the duties on plate-glass

is sure to be called for by the thousands of householders who shiver in winter behind their thin sheet-glass windows, while the cold is shut out of even very modest houses in England and on the Continent by plate-glass a quarter of an inch thick.

THE Director of the Prussian Meteorological Bureau has collected some important statistics in regard to the increase of casualties by lightning, which has become so rapid in Europe as to excite alarm. The insurance of buildings against fire is now compulsory throughout Germany, but the principle of enforced insurance was first adopted in Bavaria, and, as records concerning loss by lightning have, in consequence, been carefully kept there for some years, the statistics of Herr von Bezold are based on these records. This evidence, the accuracy of which can hardly be questioned, shows that the loss by lightning in Bavaria has increased six-fold within a few years. A part of this increase might possibly be ascribed to the growing disposition of the peasants to make claims on the insurance companies for small casualties; but it appears that the average annual number of thunder-storms has risen materially, as well as the average destructive effect of each. What may be the reason of this change, Herr von Bezold does not try to conjecture. It is said that the destruction of forests increases the violence of thunder-storms, by removing a means for the harmless passage of electricity from the clouds to the earth; but forests are carefully protected in Bavaria, and the number of forest trees probably increases, rather than diminishes. It is not impossible that the artificial disturbance of the electrical balance of nature, which is now carried on at a vast scale in all civilized countries, may have an influence on natural electrical phenomena; but Bavaria, which is mainly a farming and wooded country, should suffer less from such a cause than England or Belgium, or the vicinity of the great cities, and it does not appear that this is the case.

ANOTHER meteorological phenomenon which has given much trouble of late years, particularly in Italy and France, is hail. In those countries hailstorms are frequent and violent, particularly at the season when the grapes are ripening, and the produce of the vineyards over a large tract of country is often destroyed in a few hours. To meet this danger, the vineyard proprietors in Italy and France, and, to a certain extent elsewhere on the Continent, have recently set up great numbers of cannon, placed vertically on a stone foundation, and shaped like trumpets, so as to send the smoke well up into the air. The Government in both countries approves the plan, and encourages it by furnishing ammunition at a very low price. When a dark cloud is seen approaching, the careful farmer runs to his vineyard with a quantity of cartridges, and fires his cannon at the cloud as it passes over. For some reason not yet explained, the concussion seems to prevent the formation of hail, and, if there is any precipitation over the tracts so guarded, it is in the form of rain. At first sight, this looks like the old rain-making plan, but the object sought is far less difficult of attainment, and statistics seem to prove that valuable results are secured.

EVERY one knows how pieces of iron are brazed together, by means of melted spelter, or brass, but every one may not know that only wrought-iron can be successfully brazed, the carbon in cast-iron, which exists partly in the form of particles of graphite, preventing the adhesion of the spelter, just as a coating of dust prevents the adhesion of cement to bricks or stones. If the graphite layer could be removed before brazing, there seems to be no reason why cast-iron cannot be brazed as well as wrought-iron, and a process for accomplishing this result has been patented in Germany, consisting essentially in applying to the surfaces to be united an oxide of copper, and protecting them against the influence of the air with borax or silicate of soda. When the joint is heated, the oxide of copper gives up its oxygen to the graphite, converting it into carbonic oxide gas, which escapes in bubbles, while particles of metallic copper are deposited on the iron. Any oxide of iron which may be formed is dissolved by the borax, and the surfaces of the iron, thus freed from graphite, unite readily with the spelter which is run into the joint before it cools, the copper already deposited on the iron assisting the process. The inventor claims that cast-iron can in this way be readily brazed in an ordinary blacksmith's forge; and, if this prove to be the case, he has certainly conferred a great benefit upon industry.

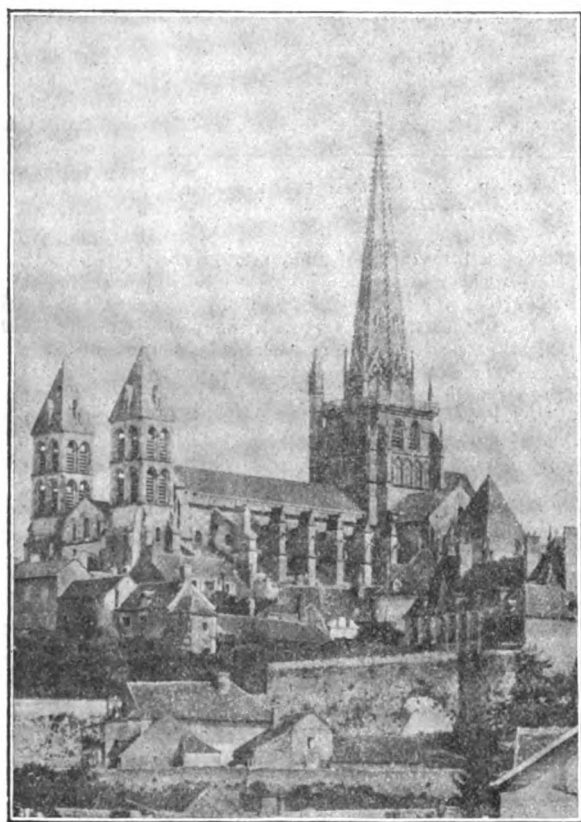
A CORNER OF OLD FRANCE.¹—II.

The Hospital, Beaune.

OF Beaune, the next town to be visited, it may be said without exaggeration that it is perfection. We all know the name of Beaune on wine-bottles, and indeed the town would be worth visiting on the strength of this reputation alone. Not merely do I mean for wine-drinking purposes, but for the sake of the evening walk which you may have under a pale, warm summer sky, among the glowing vineyards of the Côte d'or.

At Beaune you will find besides these delights of the vineyard, a moat (such a moat!), town-walls and ramparts planted with plane-trees, and two or three first-class subjects for sketches in every street. But these glories are mere additions to the two jewels of the place, the church of Notre Dame and the incomparable hospital.

The hospital at Beaune is one of the few buildings, other than churches, which has retained its spirit as well as its body. It is seldom that one finds a secular building of the Middle Ages whose use to-day is the same as its use in the past — not that one can call this hospital a secular building in every sense, for the gracious work which is done there is as much a work of religion as a medical aid. The buildings, which front on the street and are covered-in by a long, high-pitched roof, contain a ward which is, perhaps, one's ideal

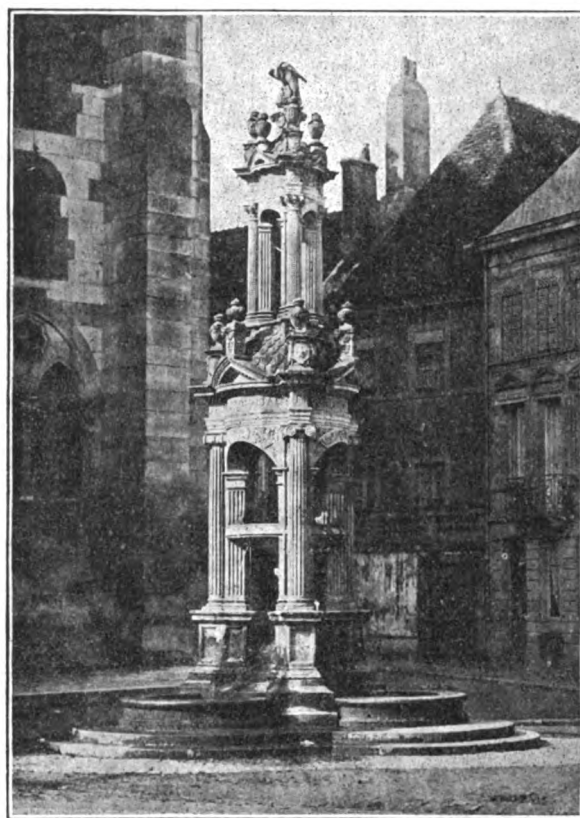


The Cathedral of St. Ladre, Autun.

of what a hospital ward should be. Those who know the almshouse at Chichester will be able to bring to mind something which in its original intention was practically the equivalent of this great and beautiful ward. My companions and I visited it at seven o'clock

on a summer morning — an hour at which one best understands the full significance of the place. On either side are beds placed, not as in our modern hospitals with the feet outwards, but longitudinally and close to one another, with no space between. There is a passage-way between the beds and the wall in which the patients can dress, but the space between the two rows of beds, which is wide and ample, is quite free from hospital furniture, and in this particular ward is supplied with ordinary church chairs. One notices a tall pulpit rising from the floor. The end of the room is cut off by a chancel-screen, beyond which is the altar, where at the moment of our visit mass was being celebrated. The nuns — ladies of good family — who serve the hospital as nurses, were hidden from view, being ranged on unseen seats to the right and left of the altar. A few townspeople and the sister in charge of the ward knelt in the public space, and when the mass was over, a procession, headed by a small server with bell and candle, threaded its way around the court-yards of the hospital. It was at this point that the hitherto hidden sisters came into view, as they streamed out in an orderly procession after the priest. We walked out into the court-yard and saw them pass by, the living evidence that there are some things of the Middle Ages — and good things, too — which keep their vitality at the present time.

The hospital was founded in 1443 by Nicholas Rollin, Chancellor of Burgundy, of whom Louis XI said in unfriendly jest, "It is well that he who has made so many paupers during his life should prepare an asylum for them before his death." The sisters who serve the



Fountain of St. Lazare, Autun.

building are of the Order of the Holy Spirit, which belongs to Malines, and their costume is the same as it was in the fifteenth century. The pavements — which are of tile — bear the oft-repeated initials of the founder and his wife, Nicholas and Guignon, twined together with an oak-bough and the motto "Seule," alluding, if I remember rightly, to the latter's widowhood. One could spend much time in describing what one may call the spiritual aspects of the place, which are so strong as to be not easily passed by; but as our concern is with architecture and such things, we must pass on to the more material side of the hospital's beauty.

The roofs and gables are profusely decorated with vanes and finials, mostly cast in lead and bearing a distinctive Flemish character. There are a few which have been restored, but as the models from which the originals were cast have been preserved in the hospital, there is no doubt of their authentic shape. The first courtyard one enters is strikingly picturesque; it has a double gallery extending round two sides of it, which forms a cloister on the ground-floor, and a covered passage to the upper rooms. There is little incident in the centre of the court-yard, the rough paving of which is interrupted only by one or two well-heads; but there seems to be always a group of picturesque convalescents and nurses and a flight of pigeons to catch the sunshine. The dispensary, with its long ranges of earthenware vases, each decorated with a symbolical serpent, reminded us of the dispensary at Monte Oliveto, near Sienna, and the great council-hall on the first floor — in which takes place the annual sale of the wine, which is the hospital's principal source

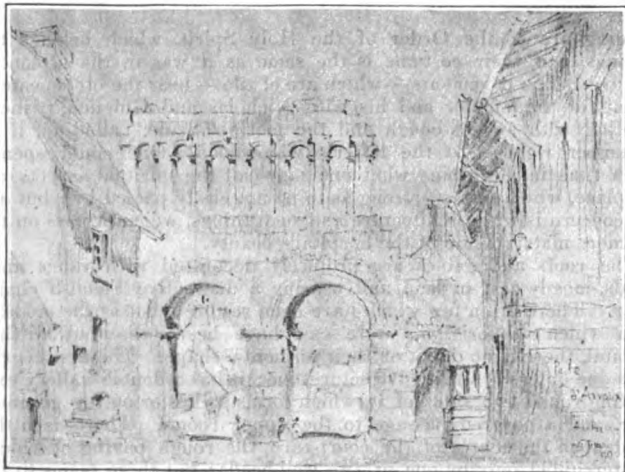
¹ Continued from No. 1289, page 77.

of income—had many treasures to show in the way of tapestries. One of the hospital's best possessions is a superb altar-piece by Roger van der Weeyden, no longer kept above the altar, but exhibited in an upstairs room. Viollet-le-Duc has laid the hand of the restorer upon the place, but with singularly little evil effect; the whole presented a truly Gothic appearance, and though it is of the late type, to be sure, it was true Gothic of its type, and we felt in walking through its court-yards that we were veritably back in the fifteenth century.

The church of Notre Dame has many claims on an architect's attention. It has, to begin with, a splendid narthex—an outside one in this case—standing in front of the western portal and rather older in date than the body of the church. The interior is of an altogether unusual, a transitional, type—in fact, one is not prepared by anything outside for the altogether remarkable surprise which the interior offers. The nave-piers and their arches maintain some of the features which one is accustomed to associate in England with the period between Norman and Early Pointed architecture, but as the eye travels upwards, there is seen an evidence of Roman mimicry—to call it by no other name—which finds few parallels in pre-Renaissance times. The lower parts of the vaulting-ribs are fluted pilasters; the string-courses which run round the church are of a heavy Roman, and in truth not very graceful, type, while the triforium is an unadulterated Roman arcade. No doubt, it was the presence of Roman remains in the neighborhood which induced the builders to give way to what is in effect a sort of prophecy of the Renaissance. A view of the east end, which one gets from a back street, is well worth seeing; the tower, as viewed from this point, preserves the Transitional characteristics, and the windows of the chapels in the apse bear out a reminiscence of Norman work, but as the apse mounts higher one sees traces of freer and later treatment in the clerestory windows, which, indeed, seem to have got ahead, in point of date, of the severity of the intervening buttresses. There is a very good piece of Renaissance loggia-work in the backyard of a shop in the town.

Autun, the next convenient stopping-place, is a still more Roman town than Beaune; in fact, its name but barely conceals the Roman title *Augustodunum*. It has been in happier and earlier days a larger town than at present, the result of which is that the outer walls are very far from the present circle of buildings which form the city, and there are little bits of country and rather dreary lanes between the streets and the Roman gateways, which are, perhaps, the special glory of the town. One of these, the Porte St. André, has been restored by Viollet-le-Duc, but has retained a good many of its old stones; the other, the Porte d'Arroux, which is very finely placed near the river, looks its best from the parapet of the bridge. Both consist—or rather did consist—of a double archway for vehicles, with a smaller archway on each side for foot-passengers, surmounted in each case by a sort of triforium arcade, which, no doubt, formed the communication between the guard-towers on either side.

The Cathedral of St. Ladre is splendid, and is of about the same date as the church at Beaune, though it almost surpasses it in the curiously Classical effect of its interior, in which the piers—which are not in this case of the normal rounded form, but are rather vast masses of masonry coated with pilasters—present a strangely archæological effect. The east end is without an ambulatory, which makes it cheerless and cramped in appearance. The especial glory of the church is its narthex, and in that narthex the best feature is the doorway. This is composed of a vast semicircular arch, supported on columns of Norman type. The doorway—as in the case of the familiar thirteenth-century type of French cathedral doorway—is divided into two by a sculptured column, and the tympanum is



Porte d'Arroux, Autun.

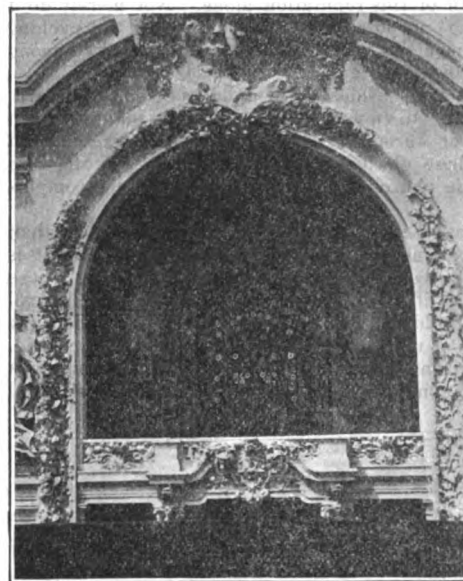
filled with rich sculpture of a singularly pure and unusual nature. In the midst is the figure of Our Lord in judgment, the strange grace of which, as well as of some of the other sculptures, has caused much speculation upon the nationality of the craftsman who carried out a

work of such refinement. There is something very unusual, too, about the figure of the patron saint, who occupies the central pier between the doors. He is in full bishop's vestments and has on either side of him two female figures, whom one could call angels if their beauty had not about it something of the pagan grace of Greece and Rome. The narthex makes up for being placed in a very awkward and narrow street by the fine effect of the stairs, which occupy almost the whole of its floor-space, and on the Sunday when I was there it offered an unusually fine setting for a church pageant—the *Fête Dieu*. The vast throng of figures in bright vestments who made the air bright with rose-leaves, as well as sweet with incense, could certainly not have been seen, if on a level floor, with the effect that came from their standing on a tall flight of steps. The north exterior of the cathedral, though it has some early features about it—notably in the transept—is mainly of Flamboyant date, the aisle having richly traceried windows and being surmounted with open-work parapets. It would be unfair to Autun to leave the place without visiting the Roman theatre, which at the present time is nothing more than a meadow with a hollow in it, and the so-called Temple of Janus, which stands in a field at the far side of the river; but Temple of Janus or no, this stalwart ruin is a fine testimony to the lasting power of Roman building.

PAUL WATERHOUSE.

[To be continued.]

AN ITALIAN ARTIST IN THE UNITED STATES.

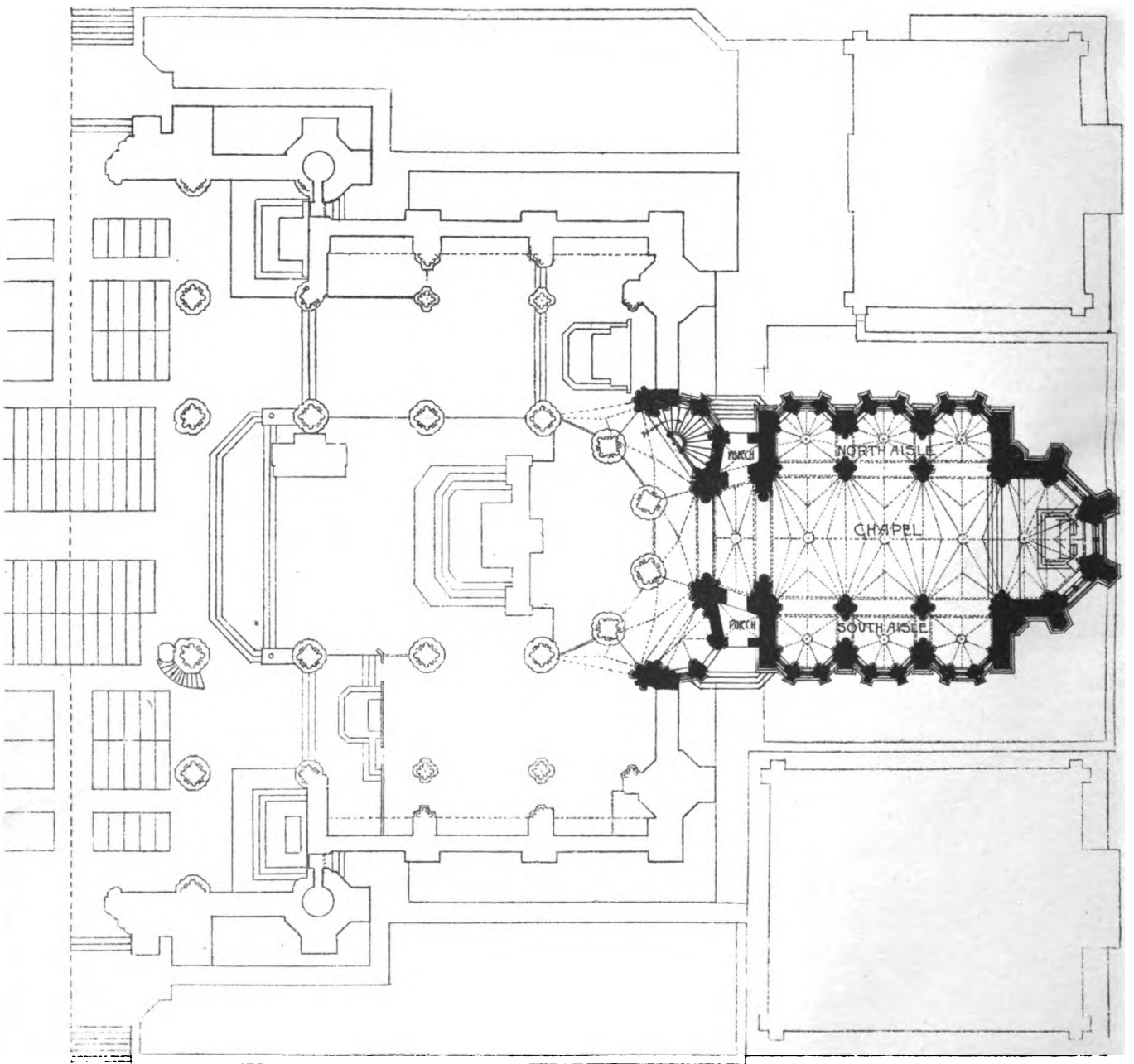
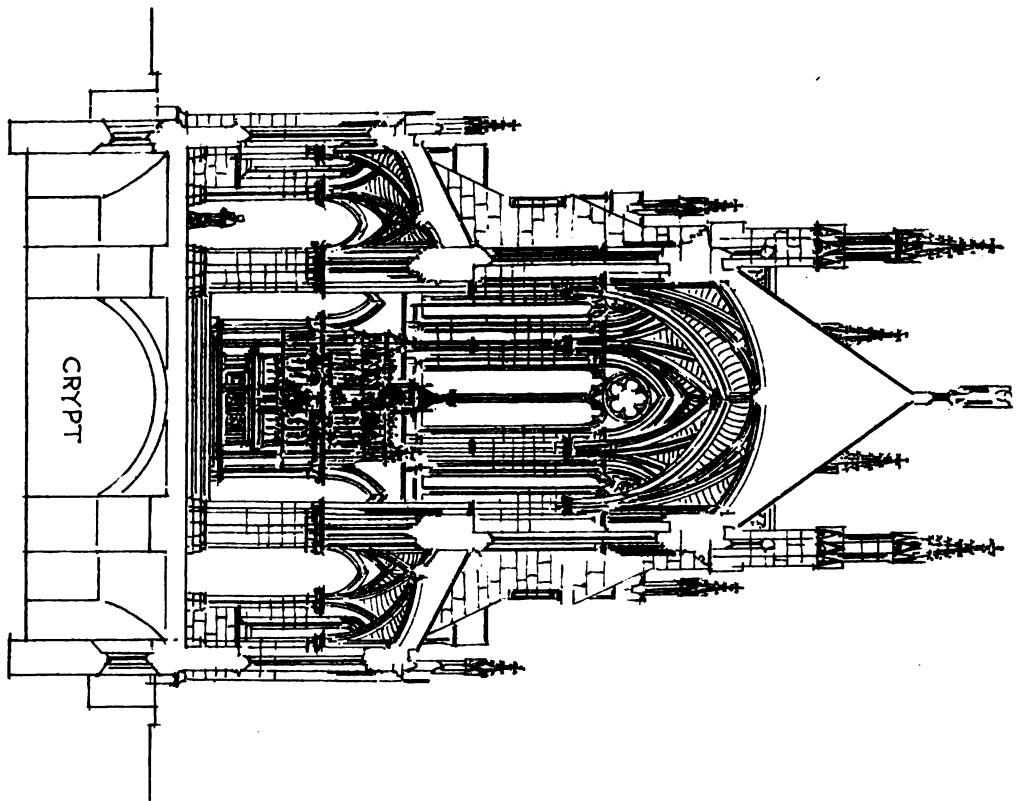


Detail from the Palais des Invalides: Paris Exposition. MM. Larche & Nachon, Architects.

THE following remarks relate to an Italian architect who, abandoning architecture, devoted himself to engraving, and, practising this art in New York and Philadelphia, enjoyed great fame all over America. They relate to Michel-Louis Pekenino, or, as he usually signed himself, Pekenino; and concerning this master-engraver I can write a short biography after a memoir published by my confrère Camille Boggio, a memoir very little known, even in Italy, where the name of Pekenino is forgotten outside of a little circle of amateurs. Nevertheless, the fame of this master-engraver is justified by his works, which, during the lifetime of the artist, were much sought after, just as now they are much esteemed by collectors. For the rest, independently of Pekenino's capacity, it is interesting for us to see an architect renounce his art to follow engraving, and emigrate to America at a time when voyages were not so simple and easy as they are to-day. It is true that in Italy, before Pekenino, Jean Baptiste Piranesi, architect, practised engraving as a master, and his name is familiar to every architect, even because Piranesi placed his burin particularly at the service of architecture and of ancient ruins. But between Pekenino and Piranesi there is a very essential difference. Pekenino practised engraving as a figure-painter, while Piranesi practised it as an architect; so, although the latter was addicted to engraving, he did not withdraw entirely from architecture in the same way that Pekenino did, who was an engraver of the same class as Charles Antoine Porporati, Raphael Morghen, Joseph Longhi, in Italy, Abraham Raimbach, Samuel Cousins and Robert Newton, in England.

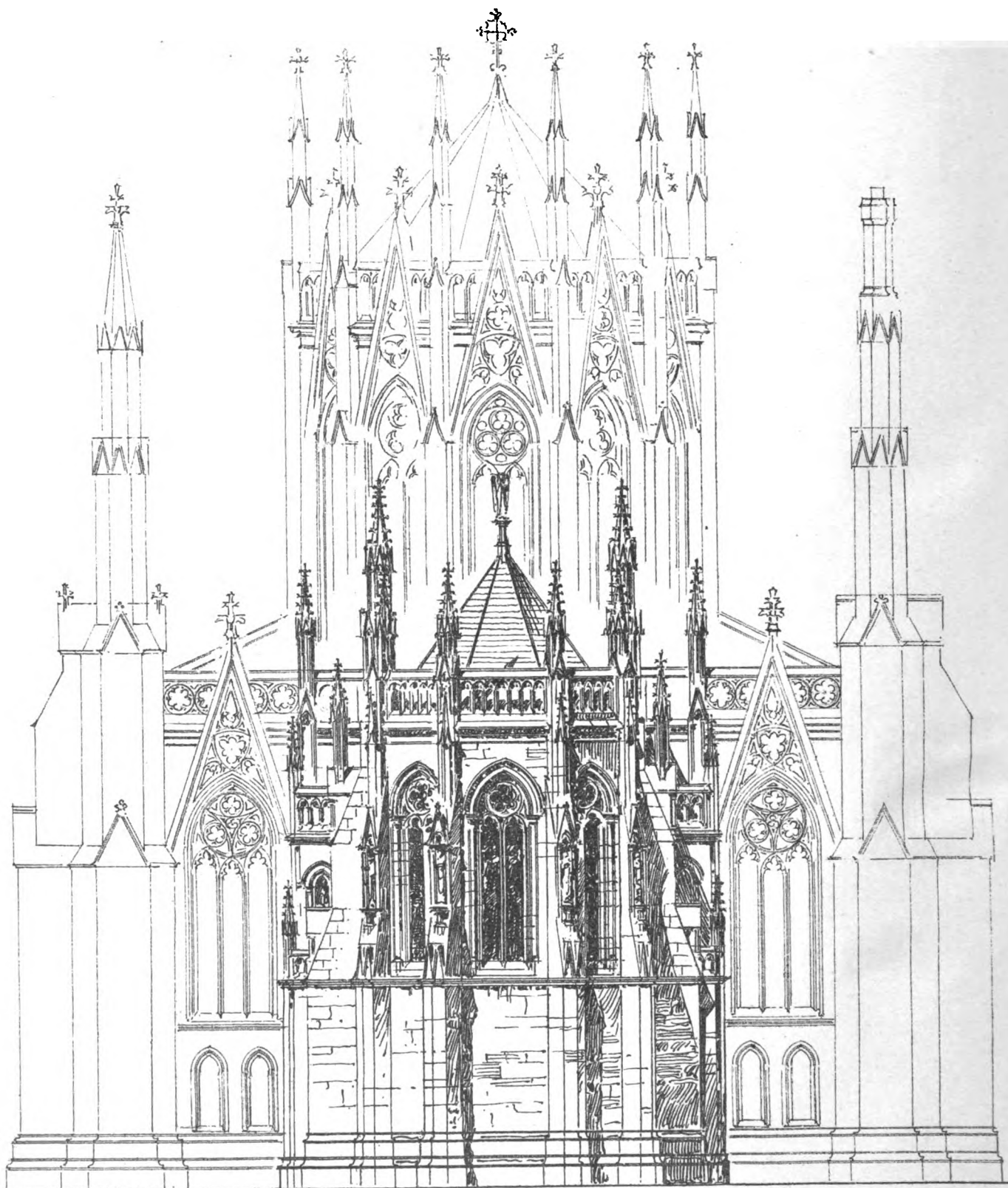
Born in the country near San Giorgio Canavese, in Piedmont, September 14, 1788, his father was a doctor of laws, and his mother, Therese Deagnostini (daughter of Joseph), ordinarily did the housework. Michel-Louis was the eldest child, and the remainder of the family consisted of another son and a daughter: Jean-François and Marie-Anne.

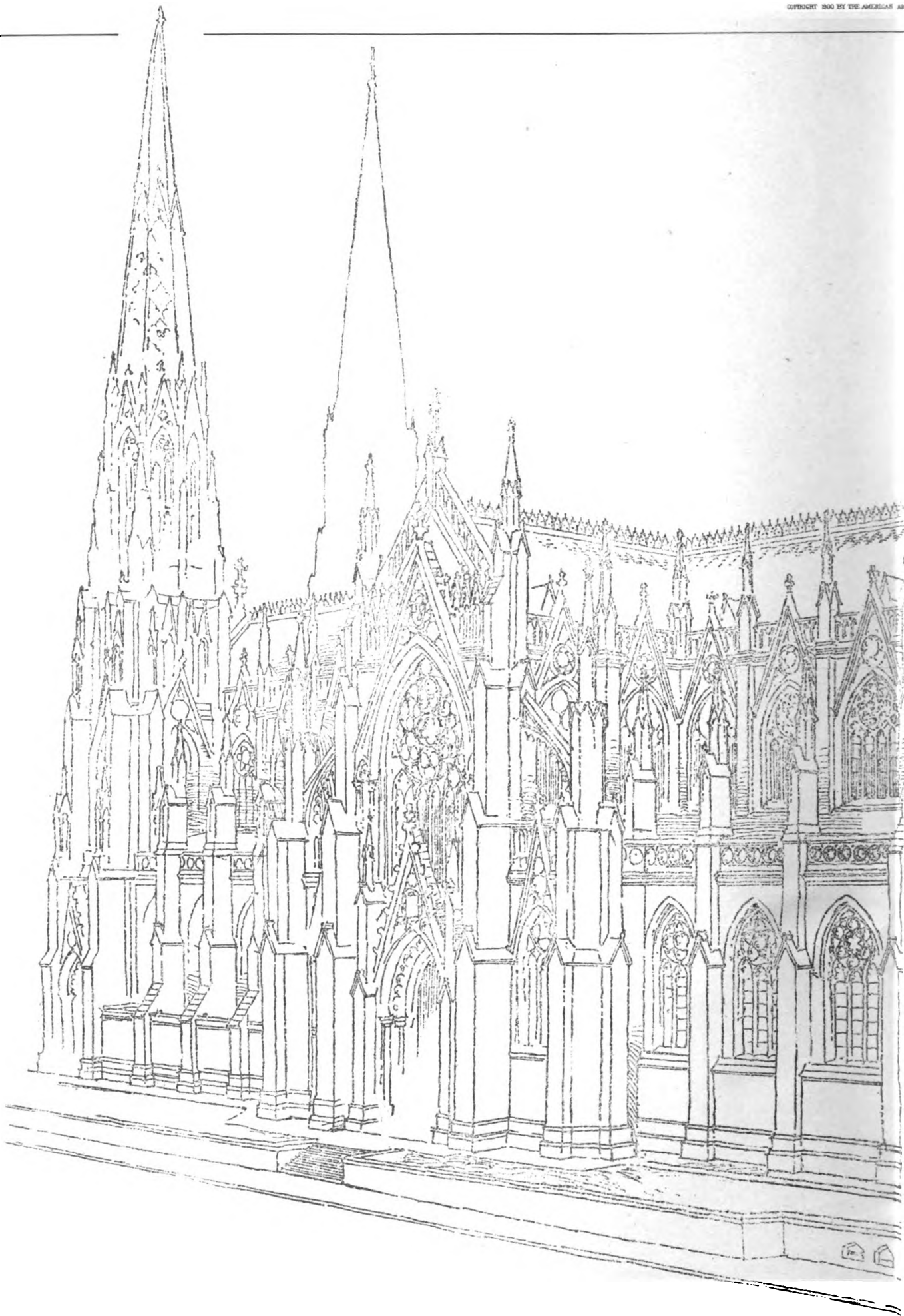
In his native country, our Pekenino was very little appreciated, and early in life he resorted to Turin, where he entered the Academy of Fine-Arts, under Ferdinand Bonsignore, in the course of architecture; and, on the 27th of August, 1810, he obtained his architect's diploma. But just as soon as Pekenino could escape from the beginnings of architectural practice, he devoted himself to pen-and-ink and figure drawing. In the Italian schools, especially in the first years of the century, the pupils knew how to draw only with compass and rule in hand. Classic art was everywhere given predominance, and it was enough that the pupils knew their Vitruvius and their Vignola for them to be mentioned amongst the most intelligent

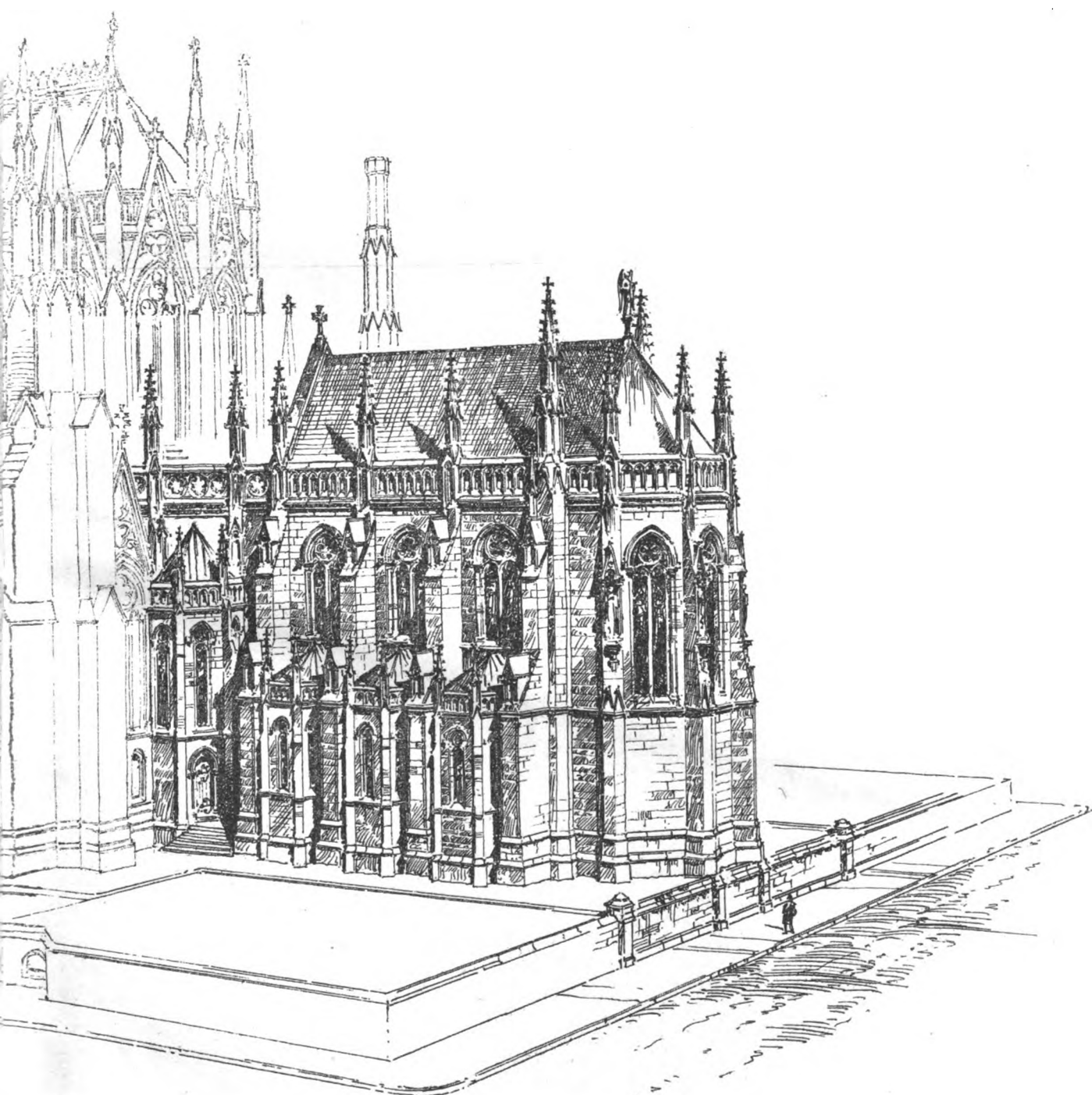


A COMPETITIVE DESIGN FOR THE LADY CHAPEL OF ST. PATRICK'S CATHEDRAL, NEW YORK, N. Y.
CHARLES C. HAIGHT, ARCHITECT.

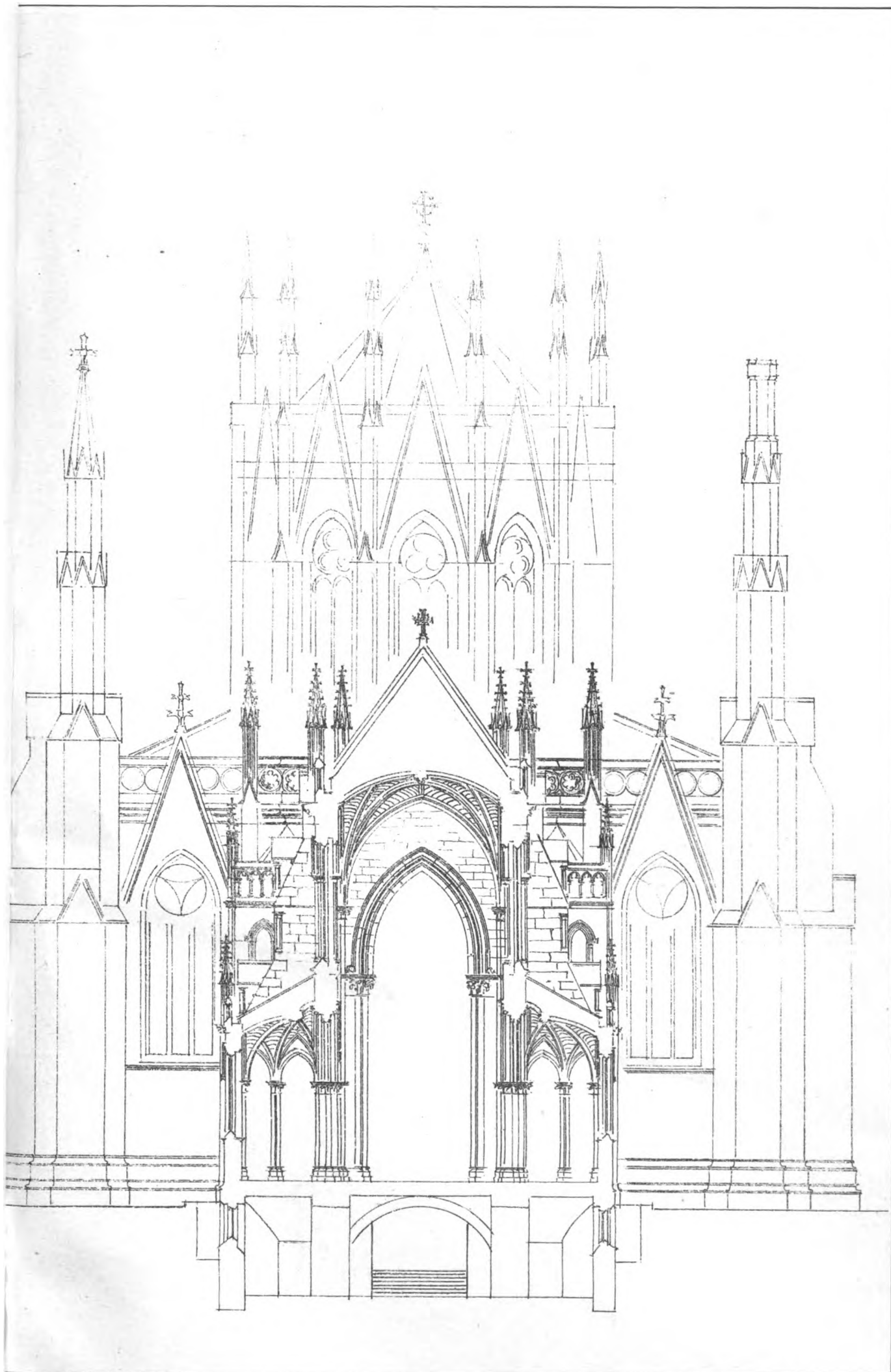
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EXTERIOR OF ST. PATRICK'S CATHEDRAL, NEW YORK, N. Y.
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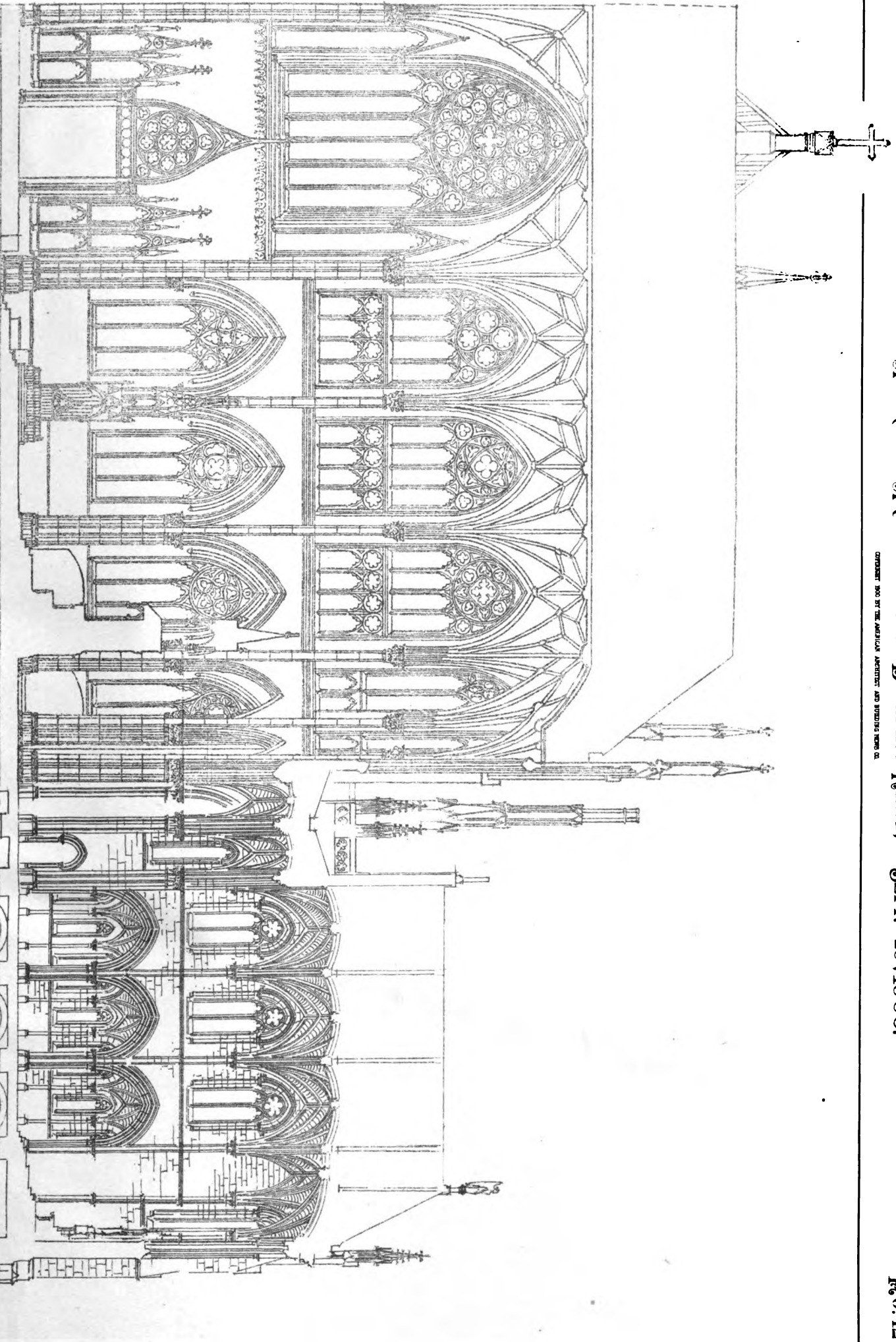
RICK'S CATHEDRAL, NEW YORK, N. Y.
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and distinguished of the rising generation. To know the proportion of the orders, to know how to draw the Ionic volute with exactitude, and to indite a dissertation on the Pantheon at Rome, was all that was demanded in Italy of a brave architect; so much so that Pekenino's professor, an impenitent Classicist, immortalized himself by a church at Turin—"La Gran Madre di Dio,"—which is a mere paraphrase of the Pantheon. As for drawing ornament or figure, that was a wholly secondary matter; so architects drew their designs and caused their statues, and sometimes their ornaments, to be executed by modellers and ornamentists. Even now, in the Italian school of architecture, it often happens that the architectural pupils apply to the figure-painters to draw in their statues.

In the midst of these strange customs, it is especially curious that Pekenino should have succeeded as an engraver of the figure, and one asks where and under whom he was able to learn the beginnings of his art; but the question is unanswerable. From 1793 to 1824 the records of the Academy at Turin are not in existence, and we only know, after a manner, that during this time there were as professors at the Academy, besides Bonsignore, Charles Ant. Porporati, an engraver, assisted by Vincent Revelli; Comolli, a sculptor, assisted by Spalla, and Laurent Pecheux, a painter. This seems to make it likely that in figure-work Pekenino was the pupil of Pecheux, the French painter and writer, author of several memoirs of an academic nature, such as a "*Discours sur l'harmonie de la Peinture*." But Pekenino might also have attended some private school. It seems fair to add that the first and second suppositions have here been made to throw light on an absolutely obscure point in the life of Pekenino, a point which it was necessary to illuminate, as it has an intimate relation with the career of the master.

People are agreed, however, on the things which concern his moral character; Pekenino was a man desirous of seeing and travelling, he was a searcher after adventures, so much so that in his youth he travelled to England. In 1816 George III was encouraging engravers, and the importation of engravings required resources of the highest order in English commerce. At this time all important publications issued in England won numerous subscribers, and the master-engravers could there count on the sale of their productions. I cannot say under just what conditions Pekenino decided to visit England, but it is probable that the favor which the art of the engraver enjoyed in the country of John Bull drew the artist thither, desirous of making himself known and achieving a place in the world. Reaching England, Pekenino did not discover there, as it appears, the land of his dreams, and he once more took up his route after a little time. Quitting England, he turned his steps towards America, in the hope of finding a fortune in that country which displays larger sympathies than we people of old Europe.

In Pekenino's time engraving with the burin, in the United States, had not received that large artistic application which it later received, and the master did not deceive himself. I have already noted that Pekenino established himself in New York and Philadelphia, and he achieved such a reputation in these places that he was spoken of as a real genius in his art. A political and literary journal which was published in Philadelphia in the twenties of this century (issue for March 1, 1822) published the highest praise of Pekenino, author of two superb engravings, a head of the Saviour and a portrait of Commodore Perry. The same journal tells us that the master at this time was employed in engraving a portrait of Washington after a painting by Stuart, and I can inform you that of these two engravings there still exists a certain number of copies. The head of the Saviour, measuring 115 x 89 millimetres, is of the same size as Raphael's "Virgin," and the portrait of Washington, dated at Philadelphia in 1822, has a height of 147 millimetres and a width of 18. Pekenino also made a reproduction of it in oval, 7 x 5 millimetres. The Commodore Perry, after a painting by Jarvis, is a reduction from the engraving by Myer, 67 x 58 millimetres.

In great part the master's engravings are dated at New York or Philadelphia, and the system of engraving adopted by him is the dotted line, which has much the effect of crayon, only in the first instance the dotted line is sometimes reinforced with hatchings, while in the second the engraver excluded them in order to make the closest fac-simile possible of the crayon strokes. Almost all of the master's engravings are signed "Pekenino" in the place of Pecheux, which is the real family name of the engraver.

Among the engravings executed in America are some private portraits: "Beattie," M. el Pekenino sc., Philadelphia, 1821; without the name of the personage (62 x 54 millimetres), copied after an engraving by G. Murray of the painting by Reynolds. "Franklin," after the painting by Janinet, 1822 (130 x 111 millimetres), of which we know three reproductions of different dimensions (71 x 57, 64 x 55, and an oval 7 x 5 millimetres). This last reproduction is really a portrait of Washington. "Goldsmith," New York, 1820 (66 x 55 millimetres); "Milton," New York, 1821 (63 x 53 millimetres); "Pope," New York, 1821 (77 x 55 millimetres); "James Thompson," Philadelphia; "Rt. Rev. William Withe, D. D.," bishop of the Protestant Episcopal Church in the State of Pennsylvania, after a portrait by Sully (142 x 118 millimetres); "Portrait of a Young Man," New York, 1821 (66 x 57 millimetres).

There were also engraved in America, without being dated, the following eleven engravings: "A Small Temple in a Garden" (172 x 113 millimetres); "Hive on a Bench near a Kitchen" (149 x 90 millimetres); "Emblems of English Liberty," (131 x 113 millimetres); "The Archduke Charles of Austria" (78 x 64 millimetres);

"Commodore Decatur" (66 x 58 millimetres), after a painting by J. W. Jarvis; "R. Harlan, M. D." (68 x 65 millimetres), after a painting by Eicholtz; "The Portrait of a Commodore" (66 x 57 millimetres); "A Man with Face Concealed by a Curtain" (68 x 59 millimetres); "Portrait of a Man," after a painting by Rogers.

As to whether the five subjects next mentioned were executed in America there is no certainty: "The Bust of Saint Catherine," after Titian (70 millimetres), and three portraits of "Napoleon" of different dimensions (99 x 67, 60 x 50 and 7 x 6 millimetres), and also a small portrait of Petrarch (9 x 6 millimetres).

From what has been recorded, it follows that Pekenino remained in the United States for a certain number of years; we do not know, however, whether he practised also his profession as an architect. The news which reached Italy gave no information on this subject. Nevertheless, it may be supposed that the master-engraver, with the renown that he enjoyed, had in America some occasion to give evidence of his ability as an architect. The thing is likely, in the opinion of those who assign to Pekenino the Villa Belloc, situated at Saint George, his native country, which the engraver might have erected after his return to Europe, an event which might have taken place in 1824. But this date is not surely accurate; M. Boggio has not been able to state with precision the time when Pekenino left the United States. M. Boggio tells us that the villa here in question was engraved about 1823, which would make it all the more difficult that the Villa Belloc should be one of Pekenino's buildings. If, on the other hand, this villa was one of the engraver's buildings, this return to architecture after a sojourn in the United States would fortify the supposition that while in America Pekenino handled the burin side by side with the T-square. Notwithstanding, I offer these only as suppositions, though, from an historical point-of-view, even mere suppositions have their utility, and may lead us on the right road.

Pekenino's return must have been welcomed with enthusiasm by his mother, since he returned celebrated in his art and the possessor of a respectable fortune. He was not yet forty years old, if we admit that his return to Europe occurred about 1824. He found himself then in the flower of his age. But in Pekenino's life everything has its curious side; even his new sojourn in his natal country, even his tragic end.

In Italy the master continued to practise engraving, and, since he was not as well known as in America, he decided to achieve a name by reproducing the celebrated painting of Raphael, "The Marriage of the Virgin." The engraving of this painting, which is one of his best works, was bought by the Florentine publisher Louis Bardi, who also desired to commission the engraver to engrave Raphael's "Transfiguration" as a pendant to the "Marriage." Pekenino accepted the order. So, after having finished the drawing, he began the engraving, which he carried to the end with the greatest enthusiasm; but, not having agreed upon any price with his publisher, a fierce discussion of the subject was inaugurated, and Pekenino, with a stroke of his burin, spoiled the plate in such a manner that not a single proof could be pulled from it.

After this mad dispute, followed by the ruin of the plate, Pekenino lost his mind; he began to believe that in Italy they were not willing to acknowledge his ability; he became discouraged, and began to commit follies to such point as to cut his plates, such as the "Franklin," which, in fact, has reached us in three morsels; and one day, collecting under his bed a great quantity of his engravings, he set the pile afire. Fortunately, the flames did not spread; but, if the flames themselves were quickly extinguished, the flames that the master carried in his own head demanded the attention of the alienists, and even their help was of no avail. Pekenino was taken to the insane asylum at Turin, December 23d, 1832, and died there, January 15th, 1835, at the age of forty-six. Two portraits made by himself remain, one an engraving, the other a water-color, and, according to these subjects, he had a well-shaped head, a broad forehead, a lively eye, a small mouth, the whole showing an energetic and intelligent man.

ALFREDO MELANI.

TOMB OF BUDDHA FOUND.



ACCORDING to London advices, Prof. Rhys Davids, the well-known Sanskrit scholar, who lectured in Philadelphia a few years ago, has located the tomb of Buddha in the district at the foot of the Nepalese Himalaya, where the founder of a religion that now numbers 350,000,000 believers moved and lived and died. Buddha was born either in 566 or 552 B. C. and died in either 482 or 472 B. C. There is some doubt as to the exact dates. Professor Davids has been working for some time in the region of the Basti district, on the west of Gorakhpur, in India, which is the district intimately associated with incidents in the life of Buddha and the Sakya tribe from which he came. Here there are several of the stone frontier pillars erected by the great Asoka, recording his visits to shrines. The most important of these is the one erected at Padaria, bearing an inscription written by Asoka about B. C. 253, recording the fact that the pillar marks the site of the garden where Buddha was born.

The neighboring ruins of Kapilavastu, Buddha's native town, are on the banks of the Banganga River, which descends from the Himalayas and flows through a rich plain. The land belongs chiefly to Europeans, and has within the last half-century been transformed from primeval forest and jungle into rich and well-cultivated fields.

All this region is described by Professor Davids as covered with small mounds, marking in most cases "stupas," or Buddhist burial-places. Among the largest of these is one situated near the village of Piprahwa, from which it derives its name. This stupa is on the land of the Birdpur grant, which was in charge of Mr. W. Pepe, who was associated with Professor Davids in making the excavations. The mound rises to a height of about 21 feet above the plain, and is about 116 feet in diameter at the base.

Excavations were commenced in January, 1898, and at the lowest depth a steatite vase, filled with small ornaments and beads of crystal, gold, amethyst and small objects of gold-leaf, was found. The stupa is composed of solid brickwork, but down the centre is a curious pipe-like drain, the purpose of which is obscure. At the depth of 18 feet below the surface a curious discovery was made, in the form of a large stone slab, about 4 feet by 2 feet, evidently covering some receptacle.

Removing this cover a stone chest was seen, in which were found three urns, a box of steatite and a crystal bowl. These objects were most beautifully finished and polished, and presented all the appearance of glass. It was evident that the coffer concealed some precious relics. The urns contained ornaments in gold, gold beads and curious impressions of a woman's figure, the upper part of the body nude, resembling Parthian work.

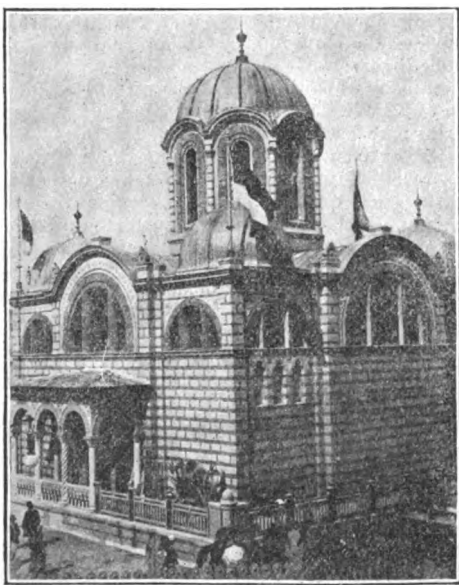
Some of these gold-leaf fragments bore figures of elephants and lions and scroll ornaments, and were evidently taken from engraved gems or tokens. There were also pieces decorated with the "savastika," or Buddhist cross. Amongst what at one time were evidently personal ornaments, pearls of considerable size were conspicuous; a few fragments of wire found show that these, with beads of many kinds, had once formed necklaces.

To whom was this ancient shrine erected? Manifestly to some person of note. One of the vases is inscribed in Pali letters of an archaic type, and, according to Prof. Rhys Davids, reads as follows:—

"This shrine for the relics of the Buddha, the August One, is that of the Sakyas, the brethren of the Distinguished One, in association with their sisters, and with their children and their wives."

If the inscription is genuine we must have here the burial-place of a portion of the Buddha's remains, and the bones found in the vases must have been taken from the pyre after his cremation! The writing, an expert declares, is certainly older than the age of Asoka, and both writing and phonology—the omission of long vowels and the double consonants—point to a more remote age than that of the pillars. — *Philadelphia Press*.

NEW GERMAN RULES FOR THE STABILITY OF CHIMNEYS.



The Servian Building: Paris Exposition.

ager of the investigation, and in a recent issue of the *Zeitschrift* of the Society he has published a report of its conclusions, of which the following abstract appears in the *Engineering Record*:—

SECTION 1. The proposed rules refer only to chimneys of the dimensions employed in the greater number of cases—that is, up to 75 metres height and 3 metres clear width at the top.

For chimneys of greater dimensions than these there is a lack of satisfactory precedent for the establishment of standards, and the rules for average dimensions would not apply to extraordinary cases. The Commission was of the belief, however, that there is no need of directions for unusual cases.

SEC. 2. As a rule 150 kilogrammes per square metre is to be taken as the wind-pressure on a plane surface at right-angles to the direction of the wind. Any chance suction on the lee side is included in this amount. Any shielding of the chimney by neighboring or sur-

rounding buildings is to be neglected. The centre of pressure of the wind acting on the stack is assumed to be at the centre of gravity of the vertical cross-section. If F represents the area of such a section, taken normal to opposite surfaces in the case of angular chimneys, the amount of the wind-pressure is $.67 \times 150 F$ for round chimneys, $.71 \times 150 F$ for octagonal, and $150 F$ for square.

These values also hold when the wind blows toward an angle. This latter direction determines the maximum pressures at edges in the case of angular chimneys.

According to articles in technical literature, a pressure exceeding 144 kilogrammes per square metre has been occasionally observed in Germany, Austria and Belgium. The Commission accordingly chose 150 kilogrammes, which is the amount prescribed in Austria also. The pressure of 125 kilogrammes, proposed by others, is too low, at least for high chimneys, because it is probable that the pressure increases with the height above the ground level. A single value is highly desirable, however, for all heights up to 75 metres. On the other hand, it may be advisable for very high chimneys in particularly unfavorable situations along the coast or on mountains to go as high as 200 kilogrammes.

The Commission recognized clearly how unsatisfactory is the present knowledge of wind-pressure and how much the preceding rules need confirmation. It therefore concluded to recommend urgently a comprehensive experimental investigation of the subject. In making the choice, however, between entirely abandoning their work or using the existing deficient material as a starting-point, the Commission believed the latter course preferable.

SEC. 3. A computation of the weight must precede the calculation of the stability.

A computation of the weight is necessary because the stability and the stresses depend on it. The following rules are suggested for lightening the work:—

The weight of a round chimney can be figured by multiplying the weight of a cubic unit of masonry by the contents of the separate drums or shells, each figured by the formula $C = .7854 z (D^2 - d^2)$. In this expression D and d are the mean inner and outer diameters, z the height of the shell; the thickness of the shell is assumed to be uniform. The weight and surface of architectural additions, caps, cornices and the like, are to be neglected.

SEC. 4. The contractor for the chimney must accept entire responsibility for the correspondence of the unit weight of masonry assumed in the computations with that of the materials actually employed, as well as for their fulfilment of the specifications for quality and strength. It is left to the party letting the contract to demand proof of the correctness of the unit weight established and of the other specifications enumerated in Section 6, or even to exercise a control over them.

It is impracticable in computations of stability to determine all factors which have a strong influence with such certainty that a subsequent calculation of the correspondence of the actual materials and strains with the assumptions may be omitted. On this account, because of the great influence of the weight on the stability and the widely different specific weights of the materials of chimney construction, the Commission did not propose a definite unit weight for masonry.

SEC. 5. In determining the stability of chimneys, which may be regarded as single masonry-masses on which the wind-pressure is the sole overturning force, proof must be had, in the interest of safety, that the resultant of the weight above the most dangerous horizontal section and the wind-pressure from the most unfavorable quarter lies within the masonry and far enough away from the outer edge to prevent any injury to the material on account of the pressure. This must be true without making any allowance for the adhesion of mortar, and assuming that the joints on the windward side can open without hindrance.

There is no doubt that masonry can resist tension if made with care from good materials, particularly after the mortar has had time enough to harden. But the greater or smaller degree of fulfilment of all such assumptions and the impossibility of providing in advance for such highly-important influences on stability as rapid construction, the weather and the like, led to the conclusion that the tensile resistance of masonry should not be taken into account.

SEC. 6. The pressure on the most heavily loaded edge must not exceed $(5 + .15 H)$ kilogrammes per square centimetre. In this expression H is the distance in metres of the joint from the top of the chimney. If the value thus determined exceeds 12 kilogrammes per square centimetre, using cement-lime mortar, proof of the strength of the stone and mortar may be called for. By cement-lime mortar is meant one containing at least one part of Portland cement to two parts of fat lime and six to eight of clean, sharp sand. If fat lime-mortar is used a pressure of 7 kilogrammes per square centimetre must not be exceeded.

The joints on the windward side must not open more than half their width. This condition is reached when A is less than $\frac{1}{2} R + \frac{1}{2} r$, where A is the distance from the centre of gravity of the section to the point of application of the resultant of the weight and wind-pressure, and R and r are the radii of circles bounding the outer and inner perimeters of the section.

The longer time spent in the construction of high chimneys, their greater area and the better grade of materials generally employed in their construction warrant higher permissible stresses in their lower portions than is the case with chimneys of less height. A measure

for this is furnished by the above entirely empirical expression. The difficulty introduced in the design by this variable permissible stress is not so great as to offset the resulting economy. In determining the permissible stress the Commission found itself in the same situation as in determining the wind-pressure, and it was considered better to make use of the incomplete existing information concerning the strength of masonry than to abandon the investigation.

As a rule the Commission held that the materials in a chimney should not be strained to more than one-tenth their ultimate resistance. It may be assumed that the preceding rules conform to this principle, at least with joints under 15 millimetres thickness. Materials of considerably greater strength are often used, and it would be unjust and unsuitable not to permit them to be strained to one-tenth their ultimate strength. But in such cases proof must be forthcoming when desired that this greater strength is actually attained during the time the chimney is under construction.

The second requirement, that A is less than $\frac{1}{3}R + \frac{1}{4}r$, calls for larger dimensions in small stacks than the first requirement. Its neglect in such low stacks would lead to an opening of the joints far beyond their middle, which might cause highly hazardous swinging, eccentric pressures, shearing and even overturning. A numerical example will illustrate this.

With an upper clear diameter of .6 metre and a shaft 16 metres high, the first requirement permits a maximum unit-pressure of 7.4 kilogrammes. With a unit weight of 1,650 kilogrammes per cubic metre and 150 kilogrammes wind-pressure, the following dimensions are obtained:—Thickness of top shell, .15 metre; offset of each of the five drums or shells, .05 metre; height of shell 3.2 metres; inner diameter at the bottom, 1.1 metres; outer diameter at the bottom 1.8 metres. Thus A is equal to .645 metre, although the second requirement permits only .5875 metre. The joints would open therefore on the windward side 23 per cent more than half their width, which is highly serious.

An increase in section is imperative, and may be given in various ways. By using a stone of 1,750 kilogrammes weight and increasing the batter of the chimney to 6 centimetres in the metre, the dimensions become:—Outer base diameter, 1.86 metres; inner base diameter 1.16 metres; A , .602 metre, just under the amount allowed. The maximum unit-pressure will be 5.71 kilogrammes, and the opening of the joint on the windward side will be .819 metre, less than its half. In case the permissible limit of A is but slightly exceeded, and the most dangerous section is surely in the base, the most simple remedy is to add a small plinth to the latter.

SEC. 7. In the upper offset joints the maximum stresses given in Section 6 must likewise not be exceeded. In case the shells have equal heights the test is to figure the pressure for each of the offset joints, from the base upward, until they show a decrease in the unit-stress. With drums of unequal height the pressure is to be figured at each offset section.

As a rule this requirement is answered by a few computations. The provision of Section 6 suffices to assure a gradually decreasing stress from the bottom upward. There is no objection to this because the safety of the entire structure is made dependent on the most strained joint.

SEC. 8. The maximum edge-pressure which the chimney while subjected to wind-pressure exerts on the earth must not exceed 2.5 kilogrammes per square centimetre. At the same time the base must never rise from the earth at the windward side.

In reaching this conclusion, the Commission again had to overcome many difficulties. The character of the earth, its dampness, the depth of the foundation and numerous other circumstances presented a host of variations. It was also noticed that nearly everywhere there were already regulations concerning the allowable loading of earth. Hence many of the members were opposed to the fixing of the 2.5 kilogrammes limit, and the section was finally adopted by a majority of a single vote. The other sections were approved unanimously, or practically so.

The Commission thoroughly discussed the matter of proposing a single carefully elaborated method of computing the stability, and decided not to do so. After it was determined not to allow tensile strength to be considered, those methods of calculation were necessarily excluded which figure the stack merely as an upright subject to pressure and bending. For the computation of round chimneys the Commission recognized the simplicity and safety of the tables of Professor Keck, of the Hanover Technical Institute, and the methods of Professor Lang, of the same school. But it was finally deemed best to permit any correct method.

THE RESTORATION OF CHICHESTER CATHEDRAL.



HE Secretary to the Society for the Protection of Ancient Buildings writes as follows to the *Times*:—

Chichester Cathedral is fast being lost to us—not by the hand of time, but by the hand of man. If one of our modern towns decided to erect a reproduction of Chichester Cathedral, no one would look upon the imitation in the same light as Chichester Cathedral, and yet, given time (money they can always get), this is what the “restorers” will do, for they are busily engaged in making Chichester Cathedral into a model of itself.

On November 6, 1897, the *Times* published a letter from this Society calling attention to the risk to the ancient work of building a new northwest tower, and again, on October 18, 1898, it published

another letter from the Society showing that its fears had been only too well founded.

An appeal for funds, dated June 20, and a report have been received by the Society. This report ignores altogether the damage caused by the new tower, although people in Chichester have a lively recollection of the recent anxiety caused by the cracks in the west front.

Our letter of October 18, 1898, says: “The west wall of the nave has been cracked from top to bottom, and a visitor approaching the cathedral by the western porch will see two fresh long cracks over the large doorway, one being apparently about an inch wide, and the other a quarter of an inch wide, and on entering the building it will be seen that the cracks go through the full thickness of the wall and run right up to the groining.” The report just issued says: “This (west) wall, a little to the north of the centre line, is slightly fractured from top to bottom, and to a still less extent on the south side; these fractures are, no doubt, due to a defective foundation, to which also at an early period the inclination of the large tower buttresses may be attributed, and they were without doubt increased by the fall of the northwest tower.” Now, this fall was upwards of two centuries ago.

The Society’s statement before being made was carefully verified, and was not (and could not be) contradicted. A letter from Mr. Walter Crane was published in the *Times* of October 25, 1898, calling attention to this.

Beyond this question of the cracks, and as is usual with “restorers,” the work of previous “restorers” is condemned in this last report, and funds are now asked for to allow of the modern west window being “replaced by a treatment more in harmony with the thirteenth-century work”; and of the west porch it says: “The centre feature of this archway has been renewed; it unfortunately is but little in character with the old work.” How can “treatment more in harmony” be guaranteed?

Those who can spare the time to take the report and read it over standing opposite to the west front will see that by the time all the older “restorers’” work has been replaced by still newer work, and much other new stonework added, comprising a gable cross, coping-stones, labels and terminations, caps and bases, sills and string-courses, etc., together with new pointing which is to go over the whole, the front, with its new tower, will have acquired just the appearance of the imaginary building in the modern town which was spoken of at the beginning of this letter.



[Contributors of drawings are requested to send also plans and a full and adequate description of the buildings, including a statement of cost.]

A COMPETITIVE DESIGN FOR THE LADY CHAPEL OF ST. PATRICK’S CATHEDRAL, NEW YORK, N. Y. MR. CHARLES C. HAIGHT, ARCHITECT, NEW YORK, N. Y.

PLAN AND SECTIONS OF THE SAME: TWO PLATES.

[The following named illustrations may be found by reference to our advertising pages.]

RAILWAY-STATION, HIETZING, AUSTRIA. HERR OTTO WAGNER, ARCHITECT.

THIS plate is copied from *Architektonische Monatshefte*.

NEW TOWN-HALL, LYNTON, NORTH DEVON, ENG. MESSRS. READ & McDONALD, ARCHITECTS.

THIS plate is copied from the *Building News*.

[Additional Illustrations in the International Edition.]

PUBLIC GYMNASIUM, HAMILTON FISH PARK, NEW YORK, N. Y. MESSRS. CARRÈRE & HASTINGS, ARCHITECTS, NEW YORK, N. Y.

VIEWS IN BEAUNE, CÔTE D’OR, FRANCE.

WEST DOORWAY: ST. LADRE, AUTUN, FRANCE.

SKETCHES IN A CORNER OF OLD FRANCE, BY MR. PAUL WATERHOUSE, F. R. I. B. A.

SEE article elsewhere in this issue.

DESIGN FOR THE NEW SESSIONS HOUSE: OLD BAILEY, LONDON, ENG. MR. J. BELCHER, ARCHITECT.



The editors cannot pay attention to demands of correspondents who forget to give their names and addresses as guaranty of good faith; nor do they hold themselves responsible for opinions expressed by their correspondents.]

FIREPROOFING BUILDINGS ALREADY BUILT.

STATE LIBRARY, ALBANY, N. Y., September 20, 1900.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Dear Sirs,— We have too many fires in libraries. Some catch from sparks from chimneys and from adjoining fires. What is there in the nature of a fireproof slate paint or other treatment for roofs and the clapboards or shingles of wood buildings that will really furnish protection? Is there anything else that would be better, to protect a wooden building standing within 30 to 80 feet of another which might burn?

I send this inquiry to three or four people whom we think most likely to know what there is and what merit it may have.

Yours truly, MELVIL DEWEY.

[SLATE paint would only protect such a building for a short time against sparks. For real protection, the best simple means would be to wire-lath the building all over, outside the clapboards or shingles, and plaster with mortar containing cement, and replace the shingles on the roof with tiles. — EDS. AMERICAN ARCHITECT.]



THE IMPERIAL TOMBS AT SPEYER.—The opening of the Imperial Tombs in Speyer Cathedral, in the Bavarian Pfalz, was begun on August 17, in order to see what historical relics were left after the rifling of the tombs by the French in 1680, and at the time of the Revolution. The Cathedral at Speyer was founded in 1030, and built immediately afterwards. There were buried there eight German Emperors—Conrad II, Henry III, Henry IV, Henry V, Rudolph of Hapsburg, Philip of Suabia, Adolph of Nassau, and Albrecht of Austria, who was murdered by Johann the parricide—and three Emperesses and a Princess—Beatrice, the wife of the Emperor Frederick Barbarossa, with her little daughter, Agnes Gisela, the wife of Conrad II, and Bertha, the wife of Henry IV—two Bishops of Speyer, and an Imperial Chancellor. The definite results up to the present are the discovery of the body of the founder of the Cathedral, Conrad II, and that of another Emperor not yet identified. A large copper crown was at the head of each body, with a cross and three lilies in the front. The crown found with another body had the following legible inscription: "Gisilla Imperatrix R.," proving the remains to be those of the wife of Conrad II. The remains of a figured cloth, with portions of gold edging, were also found. A lead tablet on the grave of the Empress gives her birthday as having been on November 11, 990, which contradicts what has hitherto been believed. The bones of Adolph of Nassau are also thought to have been found. An oak casket has also been found in a large vault, containing bones from various bodies and a sword. Most probably these are the bones which, after the great desecration of 1680, are known to have been collected together and buried in an oak casket in 1739. Recently another body was found in a state of decay, shrouded in a cloth. There was a copper crown with the body, which is supposed to be that of Henry III. The bones of the Emperor Henry IV have also been found. The gilded copper crown was broken. The clothing has, unfortunately, mouldered away, except a few fragments. A beautiful heavy gold ring was found on the right hand, with a large rock crystal, surrounded by three pearls set clear in filigree. The workmanship shows Roman forms. The grave of Henry V was also found. — *Berlin Correspondence London Standard.*

THE "BAUWAGE" USED BY THE CATHEDRAL-BUILDERS.—An interesting explanation has recently been given of the methods used by the architects and builders of the early cathedrals to determine the equilibrium of the arches and supporting columns. The various problems connected with their construction were solved by a graphic method, which involved the use of the "Bauwage," or building balance. This consisted of a flexible cord in the form of an inverted arch, passing over pulleys at either end, the cord being drawn into an equilibrium polygon by weights suspended at various points along the cord, each proportionate in position and amount to those which the arch would be required to carry at its various points. By means of weights connected with the cords passing over the pulleys at each end the system was supported and the horizontal force also measured. From the curve thus obtained, the various elements could be readily calculated and a reliable method of construction devised. The system was employed by the so-called master-builders, who were included in a guild that extended over Europe during the Middle Ages. Through this guild the traditions and higher knowledge of the building art were confined to a few masters in each country, and there is every indication that they were endowed with more than mere artistic feeling and intuition in carrying out their constructions. The graphic method described was used before 1585, but previous to that time it is hardly thought to have carried with it any special knowledge of the laws of statics. — *N. Y. Evening Post.*

SKYSCRAPER MAIL-SERVICE.—The large amount of mail-matter which arrives at the New York Post-office every day, addressed to the tall business blocks in Broadway and Park Row has caused the creation of what the postmen call "skyscraper" mail-routes. They are considered quite a "cinch" for the winter, and the men who have been assigned to them are congratulating themselves that their work will be indoors. As many as three carriers have been assigned to some of the larger buildings, where the population is greater than that of many small towns and the mail-matter received much greater in proportion. The Empire Building, American Tract Society Building, Park Row Building and Equitable Building have at least 3,000 occupants each, and have forces of mail-carriers large enough for towns of that size. The daily population of the Equitable Building is 3,100, and three carriers work eight hours a day to handle the mail, which averages about 18,000 pieces a day. Every forty-five minutes mail-wagons run over from the Post-office and carry back with them 75 pounds of outgoing mail. Many people who do not have regular offices in the building have their mail sent in care of friends, and this adds considerably to the quantity. The Park Row Building, with six floors given over to city departments, has an equally large mail. The Empire Building averages 35,000 pieces a day, and there are several other buildings which receive almost as much. The plan of making these big buildings separate delivery routes has given much satisfaction, and will be continued by the postal authorities. — *N. Y. Tribune.*

DISCOVERY OF A RUBENS AT WAPPING.—Remarkable finds are the order of the day. London is excited over what it believes to be a real Rubens, discovered in an out-of-the-way Catholic church, at Wapping. Wapping would be the very last place where it would have been deemed possible to find a Rubens. The Church of St. Patrick, in Old Gravel Lane, has been possessed of a picture which for untold years was hung on the walls so as to cover a piece of ugly brickwork. Later on this picture was hung, of all places, in the church porch. It was begrimed. Nothing could be made out of it. Some time ago a well-known English artist, Mr. Greenwood, was attracted by "a something" in the old picture. Mr. Greenwood had the picture cleaned. Strange to say, the task was an easy one. The varnish was so solid that with a few cautious wipes the colors of the picture at once stood out. From all appearances, it looks as if the work came from the hand of Rubens. It depicts the body of the Saviour after the descent from the Cross. One figure, that of Mary Magdalen, is said by the experts to be typical of the great master. Many other traits of resemblance are discoverable. So far nothing has been determined as to the history of the picture. How did it come to Wapping? That is not answered. One theory is that the picture was brought to London by the Flemings, and placed in the custody of St. Patrick's Church. Another is that the picture came from the old palace at Whitehall. We would advise some caution before accepting this picture as the work of Rubens. The authenticity of the picture can, however, be soon determined, because Rubens has certain distinctive marks which are unmistakable. — *N. Y. Times.*

A RECENT THEORY OF ELECTRICITY.—An important development of the electron theory has been carried out by Robert Lang in his article on atomic magnetism contributed to the *Annalen der Physik* (No. 7). It may now be said that the phenomena of magnetism have at last been successfully reduced to those of electricity. We know from the work of Thomson and of Drude that an electric current in a wire consists of a stream of very small particles called electrons. These electrons are formed by the splitting up of the metallic atoms into a larger positive and a smaller negative portion. The positive electrons, under the influence of an electromotive force, travel in one direction along the wire, with a velocity of 1 centimetre per second. The negative electrons travel in the opposite direction with the same charge, but with a smaller velocity. The masses are in the ratio of about 9 to 1. Now, according to Lang, the negative electrons revolve around the heavier positive electrons in a magnetized metal, like a planet around the sun, and the electric convection-currents thus produced are nothing more nor less than Ampère's "elementary molecular currents." Lang calculates the speed of the electrons and the diameter of their orbit. The speed is that of light, and the figures obtained lead to conclusions in close agreement with known facts. — *Nature.*

A NEW SCHEME FOR LIGHTING PARIS WITH OIL.—About a fortnight ago experiments were made in Paris with a new oil-lamp which it is said will in certain portions of the city supplant gas, if not electricity. A number of these lamps, which are mounted upon elaborately designed wrought-iron pedestals, and which have a light of 1,000 candle-power each, now illuminate the Quai des Tuileries. It is said that they adequately light up the Tuileries gardens on one hand, while their rays are sent across the terrace to the water's edge, and on the other to the Quai and the Seine as far as the left bank to the Gare d'Orléans. *Le Petit Parisien* says that if the experiment "of effectually lighting up the dense gloom of the Quai des Tuileries, which has been especially chosen for this purpose, is successful, as every one believes it will be, petroleum-lamps will shortly replace gas and electricity in all the large squares and open spaces in Paris, and no doubt they will eventually be utilized for lighting the Bois de Boulogne." — *N. Y. Times.*

SNEEZE-WOOD.—Among its many peculiarities South Africa includes the "sneeze-wood" tree, which takes its name from the fact that one cannot cut it with a saw without sneezing, as the fine dust has exactly the effect of snuff. Even in planing the wood it will sometimes cause sneezing. No insect, worm, or barnacle will touch it. It is very bitter to the taste, and its specific gravity is heavier than water. The color is light-brown, the grain very close and hard. It is a nice-looking wood, and takes a good polish. For dock-work, piers, or jetties, it is a useful timber, lasting a long while under water. — *The Building News.*





